

County of San Diego
**CLIMATE
ACTION
PLAN**

February 2012



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Ch. 1

Introduction

More than 3 million people call San Diego County home,

where they enjoy access to coastal and terrestrial amenities and a temperate climate year round.

The County of San Diego (County) serves as the local government for more than 500,000 residents.

Growth in population and employment is expected in the unincorporated areas of the County over the next several decades. Because of this, the profile of the County and the services needed by County residents will change.

Since growth will likely occur in areas both near and far from emergency services, local potable water resources, and other infrastructure, the County will continue to focus its planning efforts to ensure responsible, sustainable growth within its borders.

As part of its planning efforts, the County is addressing the impacts of climate change on its residents, businesses, and environment. The County is committed to enhancing the safety and livability of its communities through the efficient application of land use programs that balance growth and conservation.



PURPOSE OF THE CLIMATE ACTION PLAN

The County of San Diego developed this Climate Action Plan (CAP) to address the issues of growth and climate change, and safeguard the environment for residents and visitors. The CAP will also help to make the County a more attractive place to live through decreased traffic congestion, better air quality, more efficient use of energy and water, less solid waste generation, safer streets for pedestrians and cyclists, more local amenities, and more local jobs. The CAP was designed to support the following primary functions:

- Mitigate the impacts of climate change by informing and inspiring meaningful greenhouse gas (GHG) reductions within the County consistent with Assembly Bill (AB) 32, Governor's Order S-3-05, and California Environmental Quality Act (CEQA) guidelines.
- Allow lead agencies to adopt a plan or program that addresses the cumulative impacts of a project.
- Provide a mechanism that subsequent projects may use as a means of addressing GHG impacts under CEQA, in accordance with a 2011 statement by the Attorney General.¹
- Comply with the 2011 adopted County General Plan Environmental Impact Report (EIR) Mitigation Measure CC-1.2, Preparation of a Climate Action Plan.

Although efforts are underway at the global, national, and state level, local actions are essential to address climate change effects. According to a 2010 survey of San Diego County voters, prepared for the San Diego Foundation, 72% of voters surveyed agreed that San Diego County should take a statewide leadership position in setting goals for reducing GHG emissions.² This demonstrates that residents of the County would like to see local jurisdictions take action in San Diego, like those discussed in this CAP, to reduce GHG emissions. CAPs are the primary tool for jurisdictions across the world, including many California cities and counties, to reduce their GHG emissions. More than 50 CAPs have been adopted within California at the city and county level. Locally, all cities within San Diego County have prepared a GHG emissions inventory and five have created CAPs with emissions reductions targets that are the same as or more aggressive than the Counties emission reduction target (See Table 1.1 below). By creating this CAP, the County of San Diego is doing its part to mitigate climate change and comply with state and federal mandates.

TABLE 1.1 | GHG REDUCTION TARGETS OF OTHER CITIES IN SAN DIEGO COUNTY

CITY	GHG EMISSIONS REDUCTION TARGET
Chula Vista	20% below 1990
San Diego	15% below 1990
Encinitas	12% below 2005
Escondido	15% below 2005
National City	15% below 2005

¹ http://ag.ca.gov/cms_attachments/press/pdfs/n2056_santa_clarita_letter.pdf

² www.sandiego.gov/environmental-services/sustainable/pdf/jobsfinal.pdf

CLIMATE CHANGE SCIENCE

The sun provides energy that drives the Earth's climate. Solar radiation enters the Earth's atmosphere and is trapped by certain "greenhouse" gases (GHGs) that increase the temperature, making the planet habitable by humans (see "The Greenhouse Effect" illustrated on the next page). Without GHGs, the average temperature on Earth would be about -2 degrees Fahrenheit (°F).¹

GHGs from human activities, such as burning fossil fuels for use in buildings and transportation and methane production from agricultural practices, are trapping more of the sun's heat in the Earth's atmosphere and warming the Earth.

GHG, GWP, AND CO₂E

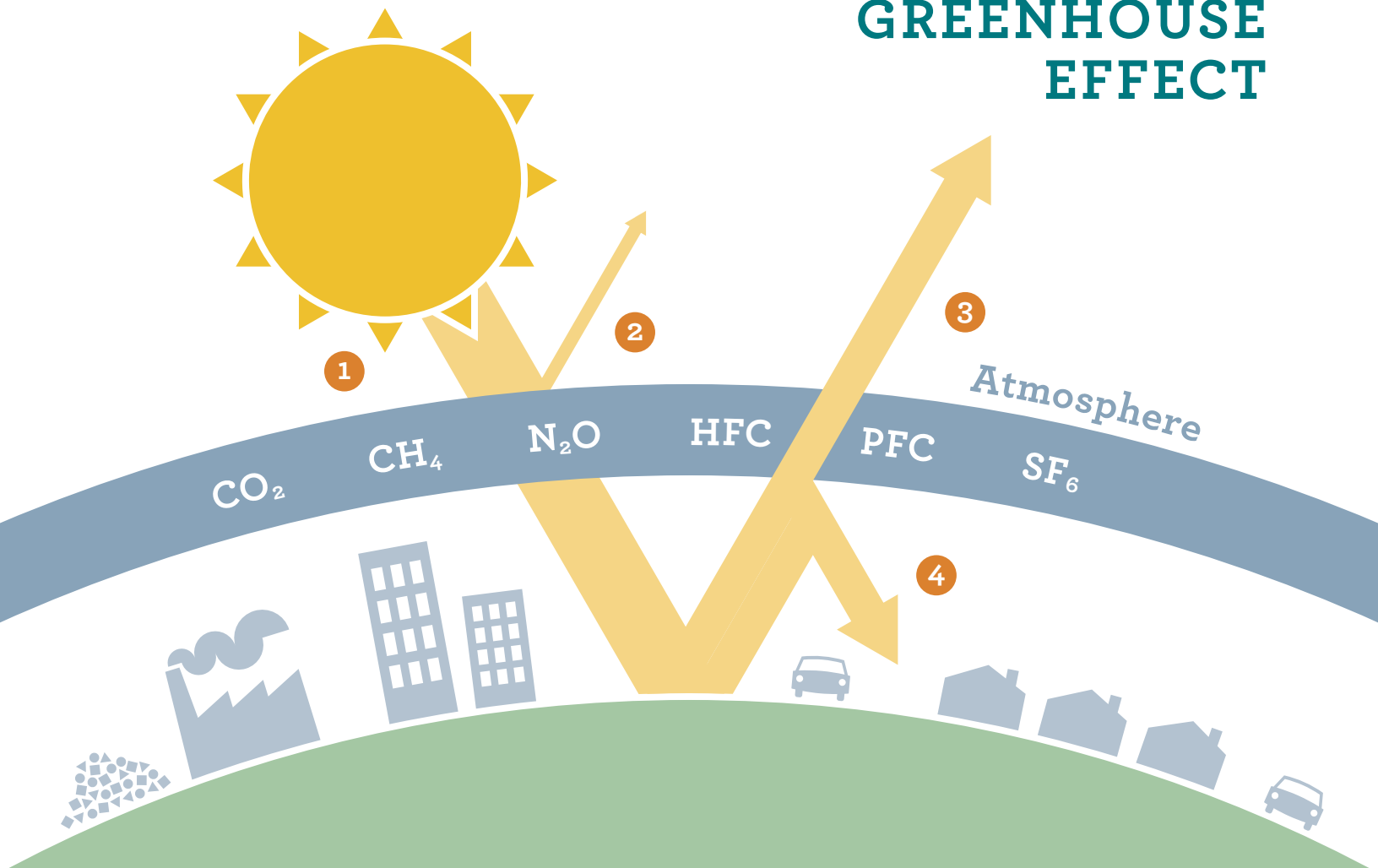
Although there are dozens of GHGs, the International Panel on Climate Change (IPCC) identifies six primary GHG compounds, including carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) as the predominant GHGs found in non-industrial processes. Each type of GHG has a different capacity for trapping heat and, therefore, GHG emissions are "equalized" by their global warming potential (GWP) and are

reported in this CAP in "CO₂ equivalents" (CO₂e). For example, 1 ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂ on a 100-year timescale and would, therefore, have a CO₂e of 21 tons. Listed below are the primary GHGs, along with their symbols, GWP, and common anthropogenic (human-caused) sources.

SYMBOL	NAME	GWP	ANTHROPOGENIC SOURCES
CO ₂	Carbon Dioxide	1	Fossil fuel combustion, forest clearing, cement production
CH ₄	Methane	21	Fossil fuel combustion, landfills, livestock, rice cultivation
N ₂ O	Nitrous Oxide	310	Fossil fuel combustion, nylon production
HFC	Hydrofluorocarbons	140–14,800	Refrigeration gases, semiconductor manufacturing
PFC	Perfluorocarbons	6,500–12,200	Aluminum production, semiconductor manufacturing
SF ₆	Sulfur Hexafluoride	23,900	Electrical transmissions and distribution system, circuit breakers

¹ http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_appendix.pdf

THE GREENHOUSE EFFECT



- 1 Solar radiation passes through the atmosphere.
- 2 A small amount of solar radiation is reflected before entering the atmosphere.
- 3 After reaching the Earth's surface, some infrared radiation is emitted back through the atmosphere.
- 4 Some infrared radiation is absorbed by greenhouse gases and stays in the atmosphere. The more greenhouse gases there are, the more infrared radiation, or heat, is trapped in the atmosphere.

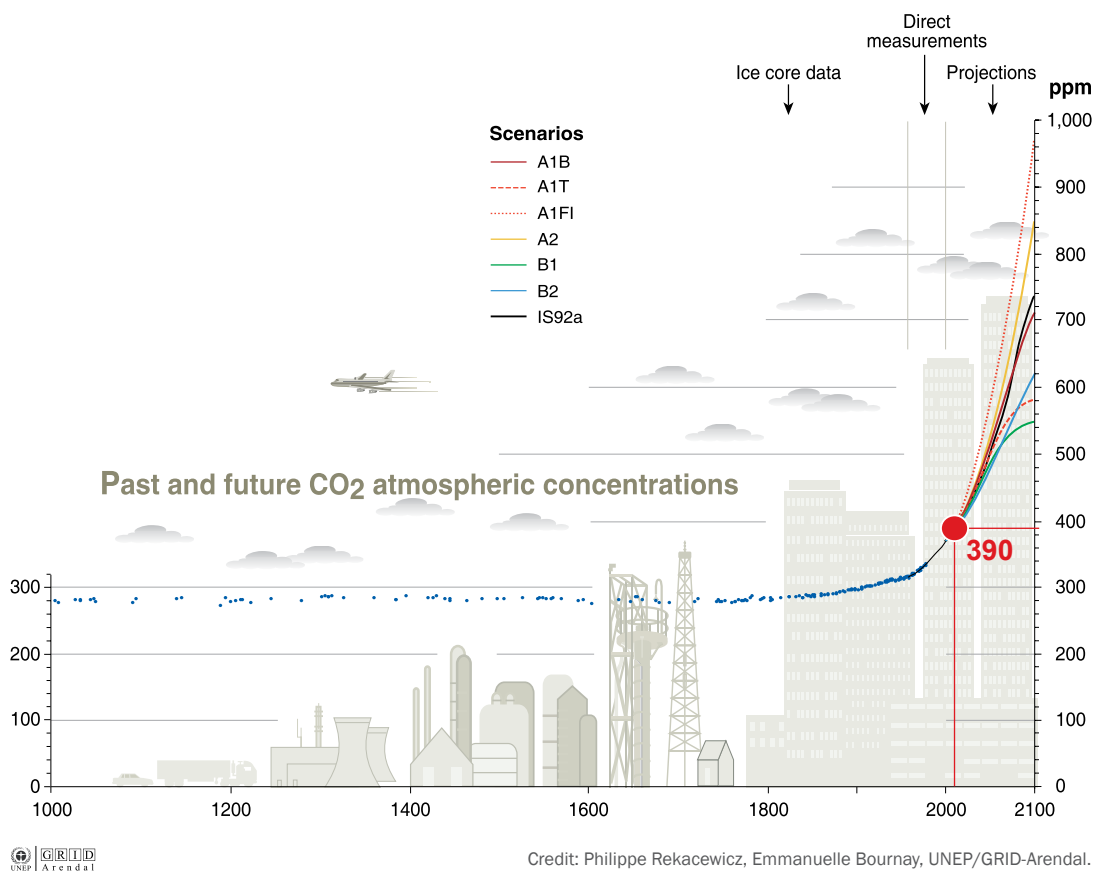
The present level of CO₂ concentration (390 parts per million [ppm]) is the highest in 800,000 years,¹ and likely the highest for the past 15 million years.²

Over the last century, average global temperatures rose by more than 1 degree Fahrenheit (°F), and some regions warmed by as much as 4°F, with predictions for continued temperature increases in the coming years.

In its fourth assessment of climate change, the United Nations International Panel on Climate Change (IPCC) provided a comprehensive overview of the impacts of climate change and the potential global emission scenarios for the coming century. The scenarios vary from a best-case scenario characterized by low population growth, clean technologies, and low GHG emissions; to a worst case scenario where high population and fossil-fuel dependence result in extreme

levels of GHG emissions. Future concentration of CO₂ in the atmosphere could range from 550 to nearly 1,000 ppm by the end of the century (see image below).

In addition to temperature increases, other climate effects are expected as a result of increased GHG concentrations, including increased evaporation, sea-level rise, more severe weather, and a rise in the spread of disease and pests that carry disease, like mosquitoes. These changes are cumulatively referred to as global climate change. If these projections become reality, climate change will threaten our economic well-being, public health, and environment. While some degree of climate change is inevitable, most climate scientists agree that to avoid serious climate change effects, atmospheric GHG concentrations need to be stabilized as quickly as possible.



Credit: Philippe Rekacewicz, Emmanuelle Bournay, UNEP/GRID-Arendal.
Scenarios refer to IPCC-developed emissions projections based on changes in economic growth, population, and technology, detailed at http://www.ipcc-data.org/ddc_co2.html.

¹ Lüthi, D., et al. 2008. High-resolution carbon dioxide concentration record 650,000–800,000 years before present. *Nature* 453, 379–382.

² Tripathi A.K, C.D. Roberts, and R.A. Eagle. Coupling of CO₂ and Ice Sheet Stability Over Major Climate Transitions of the Last 20 Million Years *Science*. 326 (5958): 1394–1397.

LOCAL EFFECTS OF CLIMATE CHANGE

Climate change is one of the most urgent global issues, and scientists are already seeing the effects of climate change around the world. Regionally, climate change is beginning to impact California residents and businesses through events such as reduced snow pack in the Sierra Nevada Mountains and increased salinity in the Bay Delta, affecting drinking water supplies in areas that depend on snow pack from this region, including San Diego County. Locally, the County is expected to experience changes including:

- higher temperatures,
- a greater number of extremely hot days,
- changes in the pattern and amount of precipitation,
- decreased water supplies accompanied by increased demand,
- increased wildfire risk,
- changes in ecosystems, and
- the decline or loss of species.

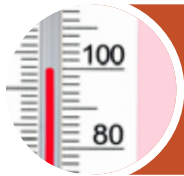
All of these changes have the capacity to impact the economy, environment, public health, and lifestyle of people throughout the San Diego region. More extreme weather events, including a greater number of extremely hot days, can lead to heat-related health issues, especially for those who cannot access cool areas. Indirectly, climate change impacts water, air, and food systems, as well as ecosystems as a whole, since climate change reduces an ecosystem's ability to maintain a healthy environment.

In addition, the environment is closely linked to the economy and public health, and changes in temperature and precipitation have rippling effects socially and economically. Some of the potential economic impacts of climate change include disruptions to agriculture and food production, strains on the health care system and labor market due to health-related illnesses and deaths, recreation and tourism declines, and changes in energy costs due to regional shifts in cooling and heating demand.

POTENTIAL CLIMATE CHANGE HEALTH EFFECTS¹

CLIMATE CHANGE EFFECT

EXAMPLES OF HUMAN HEALTH RISKS



Increase in Extreme Heat Events

Heat-Related Illness/Death
Worsening of Chronic Health Conditions



Increased Air Pollution

Increased Respiratory Illness and Seasonal Allergies



Floods, Droughts, Wildfires, Storms, Changes in Weather Patterns

Injury/Death
Respiratory Illness
Waterborne Illness
Foodborne Illness
Displacement
Stress-Related Disorders
Mental Health Impacts
Increase/Shift in Infectious Disease



Higher Food Prices and Food Scarcity

Increased Hunger
Decreased Nutrition



Sea-Level Rise, Storm Surge, Longer Red Tides (toxic algae blooms in the ocean)


Injury/Death
Wastewater System Impacts
Displacement
Stress-Related Disorders
Mental Health Impacts
Poisoning from Contaminated Shellfish

CLIMATE CHANGE AND VULNERABLE POPULATIONS:

Climate change will not affect everyone equally. People with a high probability of exposure, increased sensitivity, and without resources to adapt and prepare will be hit harder by climate change. The most vulnerable tend to be the young and the old, the poor, and those who are already sick.



¹ This graphic provides an overview of the impacts of climate change on human health; it is not meant to be an exhaustive list of health impacts. Additional information on the relationship between climate change and public health can be found at the Center for Disease Control and Prevention's Climate Change and Public Health website: <http://www.cdc.gov/climatechange/>.



The impacts of climate change on San Diegans will not be felt equally across the County.

County residents who are already more vulnerable to health challenges are likely to be among the most affected by climate change, as they face more difficulty accessing medical services; will pay more as a proportion of income for healthy food; and are more likely to live in conditions that leave them vulnerable to flooding, high temperatures, and degraded air quality. The graphic on the left shows how the population may be affected by climate change through public health impacts.

The extent to which these changes produce negative impacts will depend on actions taken today to ensure resilience in the face of climate change and, where necessary, adaptation to its impacts. Additional detail is provided in Chapter 5, Adaptation.

RELATIONSHIP TO OTHER STATE AND COUNTY DOCUMENTS

Climate change legislation and policy have been in place at the state level since 2005 (Table 1.2). Local governments have a responsibility to promote these efforts and are considered “essential partners” in achieving GHG reductions.

This CAP documents the County’s plan to meet the obligations defined in AB 32. The CAP creates a framework for ensuring that emissions reductions are in compliance with the County’s obligations while safeguarding equity among residents and businesses. In addition, the County’s goals reflect the goals shared by other local and state governments, and draw on lessons learned through the efforts of others.

This CAP incorporates already-established County goals described in the recently adopted General Plan, and in the County Strategic Energy Plan (SEP), which identifies

measures to develop a cohesive, long-term strategy that addresses climate change. The CAP includes more specific approaches for the actions outlined by the General Plan and broadens the SEP’s scope to include water conservation, waste reduction, land use, and adaptation, while also extending the County’s emissions reduction goals to 2020 and beyond.

Other public agencies and private developers may also use this CAP to comply with the California Environmental Quality Act (CEQA) through CEQA tiering for projects that trigger CEQA review. A lead agency may determine that a project’s GHG impact is not cumulatively considerable if the project demonstrates consistency with this CAP (CEQA guidelines Section 15183.5[h][3]), thereby reducing overall project costs. Details of project-level compliance are provided in Chapter 6.

PLAN ADJUSTMENTS AND FLEXIBILITY

This 2012 CAP represents the County’s strategy to respond to the threat of climate change at the time of preparation. It is a guiding document that will be used by the County, businesses, and residents to reduce GHG emissions from energy, transportation, solid waste, water, and agriculture through 2035. It is a “living” document and will need to be updated as new information, technology, and legislation require. GHG reduction-measure monitoring and regular inventory updates are necessary to evaluate the efficacy of the CAP, including at least one inventory by 2020.

TABLE 1.2 | CLIMATE CHANGE LEGISLATION AND POLICY¹

BILL & DATE OF ISSUANCE	TITLE	DESCRIPTION	IMPLEMENTING AGENCY
Executive Order (EO) S-3-05 (2005)	Greenhouse Gas Initiative	Set Statewide GHG emission targets to: 2000 levels by 2010; 1990 levels by 2020; 80% below 1990 levels by 2050	California Air Resources Board (ARB)
Assembly Bill (AB) 32 (2006)	Global Warming Solutions Act	State must reduce GHG emissions to 1990 levels by 2020	ARB
Senate Bill (SB) 97 (2007)	CEQA Guideline Amendments	Guidelines for addressing GHG emissions in CEQA documents must be formulated and adopted	California Office of Planning and Research (OPR)
SB 375 (2008)	Sustainable Communities and Climate Protection Act	GHG emissions from passenger vehicles must be reduced by set targets (developed by ARB) for 2020 and 2035, and planning organizations must prepare sustainable communities strategies	Metropolitan planning organizations (MPO)
AB 1493 (2002)	Pavley	GHG emissions must be reduced from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation	ARB
Executive Order (EO) S-1-07 (2007)	The Low Carbon Fuel Standard (LCFS)	The carbon intensity of California's transportation fuels must be reduced by at least 10% by 2020	ARB
SB X1-2 (2011)	Renewable Portfolio Standard	California investor-owned utilities must provide at least 33% of their electricity from renewable resources by 2020	California Public Utilities Commission
SB 7X 7 (2009)	Statewide Water Conservation	State must achieve 20% reduction in urban per capita water use by 2020	Department of Water Resources
California Code of Regulations (CCR) Subarticle 8 § 95550 (2010)	Regulation for Under Inflated Vehicle Tires (T-4 in the Scoping Plan)	Ensure proper tire inflation, reducing tailpipe GHG emissions by reducing tire rolling resistance and increasing vehicle efficiency	ARB
CCR Subarticle 1 § 95300 (2009)	Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure	Require existing trucks/ trailers to be retrofitted with the best available technology and/or ARB-approved technology	ARB

¹ Additional details regarding legislation can be found in Appendix E.

SCOPE AND CONTENT OF THE CAP

This CAP consists of seven chapters: Introduction; Emissions Inventory, Forecasts, and Target; Community Measures and Actions; Local Government Measures and Actions; Adaptation; Monitoring and Project Compliance; and Conclusions. The CAP includes appendices that provide additional detail, background, and methodological rationale.

- **Introduction** provides a brief description of the need for GHG reduction planning in California, gives an overview of the topics covered in the CAP, and describes state actions related to climate change.
- **Emissions Inventory, Forecasts, and Target** outlines key steps taken to develop the CAP, including establishing a 2005 baseline GHG inventory (2006 for local government operations); projecting future emissions in 2020, 2035, and 2050; and setting the County's community-wide GHG reduction targets for 2020 and 2035.
- **Community Measures and Actions** addresses the measures and actions that will help the County meet its 2020 GHG reduction target. For each measure, the plan includes a description of the measure and actions; estimated GHG reductions in 2020; responsible parties for implementation; cost; co-benefits; and potential funding sources for implementation, where applicable.
- **Local Government Measures and Actions** provides details of how the County hopes to achieve GHG reductions within its governmental operations.
- **Adaptation** discusses the effects and implications of climate change as they pertain to the County.
- **Monitoring and Project Compliance** describes how the CAP will be monitored and revised over time. It also defines the process for determining project-level CEQA compliance with the CAP.
- **Conclusion** reiterates the County's commitment to addressing climate change to protect the high quality of life enjoyed by its residents and businesses, and to responsibly comply with state and federal mandates.



Ch. 2

Emissions Inventory, Forecasts, and Targets

BASELINE EMISSIONS INVENTORY

The purpose of a GHG emissions inventory is to provide a snapshot of GHG emissions in a given year. The inventory is then used to assist policy makers in effectively implementing cost-effective GHG-reduction policies, actions, and control measures. An accurate inventory is necessary to understand which sectors comprise the largest portion of the GHG inventory, have the most reduction potential, and can be effectively influenced by policies and actions implemented by the County.

The County prepared baseline inventories at the community-wide and local government levels. The community-wide inventory has a baseline year of 2005, and emissions are limited to the County's unincorporated communities. The local government inventory has a baseline year of 2006 and only includes emissions related to County government operations. Each inventory is used to establish a baseline level of emissions, which then serves as the starting point for forming emissions-reduction targets and as a tool to gauge the performance of emissions-reduction measures.

For the purposes of this CAP, the community-wide and local government inventories are shown separately. In general, local government emissions are a subset of community-wide emissions. However, because the County operates in both unincorporated areas and incorporated cities, some of the County-managed facilities are not within the political boundary of the County and are not included in the community-wide emissions inventory. For example, the County manages 10 closed landfills, only three of which—Bonsall, Jamacha, and Valley Center—are within the unincorporated boundaries. The other landfills would be included in their respective community-wide inventories. As a result, solid waste emissions are greater in the County government emissions inventory than in the community-wide emissions inventory.

Information from the baseline inventories is important for understanding the quantity and source of GHGs emitted in the County.

This knowledge is leveraged to create and prioritize reduction strategies that will be most effective for these unique groups.

The County's baseline inventories are organized by emission sectors. A "sector" is a distinct subset of a market, society, industry, or economy whose components share similar characteristics. An emission sector may also contain subsectors that provide more specificity about the source of emissions (e.g., natural gas or electricity can be a subsector of energy consumption). The community-wide inventory is divided into seven sectors: transportation, energy, water, agriculture, solid waste, wastewater, and other. The local government inventory is divided into nine sectors: solid waste (landfills), employee commutes, buildings and facilities, vehicle fleet, wastewater facilities, government-generated solid waste, public lighting, airport facilities, and water. Finally, all emissions are standardized to metric tons of CO₂-equivalents (CO₂e), as described on page 4.

WHAT IS A METRIC TON OF CO₂E?

GHG emissions are reported as metric tons (MT) of CO₂e.

Emitting 1 MT CO₂e is equal to:

- 102 gallons of gasoline
- 41 propane cylinders used for home barbecues
- One month's worth of energy used in a house

In contrast, reducing 1 MT CO₂e would require:

- Growing 25 tree seedlings for 10 years
- Recycling 600 pounds of waste instead of throwing it away

Equivalencies are approximate and were adapted from: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

COMMUNITY INVENTORY

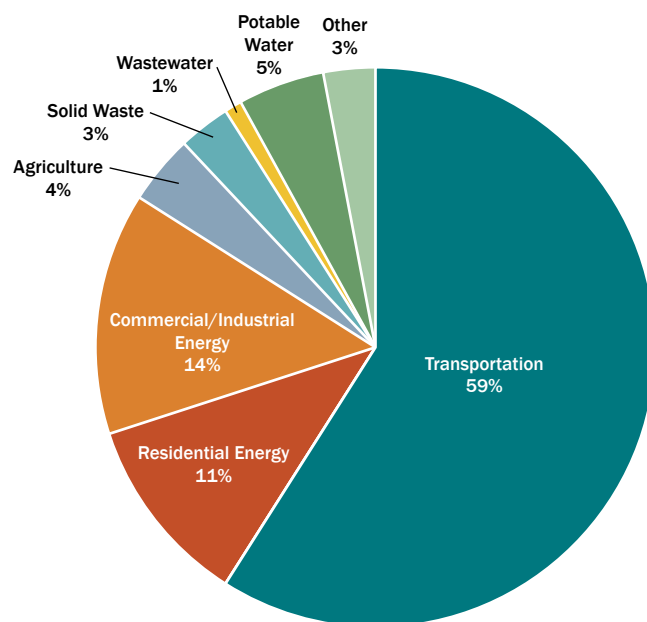
Table 2.1 and Figure 2.1 below show the baseline community-wide emissions by sector for 2005. The largest source of emissions in the unincorporated County is transportation, which accounts for 59% of total GHG emissions. Of the 4.5 million metric tons (MMT) CO₂e emitted in 2005 from all sources, more than 2.6 MMT CO₂e resulted from the transportation sector. The energy sector accounted for nearly 25% of emissions, while agriculture, solid waste, wastewater, and other sources accounted for the remaining 16% of community emissions in 2005. Additional details are provided in Appendix B.

TABLE 2.1 | COMMUNITY EMISSIONS BY SECTOR

SECTOR	2005 GHG EMISSIONS (MT CO ₂ E)
Transportation	2,636,702
Agriculture	190,025
Solid Waste	144,865
Wastewater	50,412
Potable Water	236,435
Other	132,490
Energy	1,121,650
Total ¹	4,512,580

¹ Because of rounding, the Total does not equal the sum of sectors.

FIGURE 2.1 | COMMUNITY EMISSIONS BY SECTOR



LOCAL GOVERNMENT INVENTORY

Table 2.2 provides the baseline local government emissions by sector for 2006. The County emitted 220,633 MT CO₂e in 2006 from government operations. Although all of the County-managed landfills are currently closed, methane emissions continue to be released and are currently the single largest source of emissions. Emissions from landfills accounted for 29% of all local government emissions, while employee commutes constituted 26% of emissions. Buildings and facilities were the next largest source, with 25% of total

emissions. The County's sizeable vehicle fleet (more than 2,900 vehicles) accounted for more than 10% of baseline year emissions, while wastewater, solid waste, public lighting, airport facilities, and water accounted for the remaining 9% of 2006 emissions. The large vehicle fleet is a result of the numerous region-wide services that the County provides, including sheriff; infrastructure repair, maintenance and improvement; care, management, and development of public parks and community centers; and legal.

TABLE 2.2 | LOCAL GOVERNMENT EMISSIONS

SECTOR	2006 GHG EMISSIONS (MT CO ₂ E)
Solid Waste (Landfills)	64,192
Buildings and Facilities	55,291
Vehicle Fleet	23,231
Employee Commute	57,572
Wastewater Facilities	11,656
Public Lighting	2,160
Government-Generated Solid Waste	4,892
Airport Facilities	1,153
Water	488
Total¹	220,633

¹ Because of rounding, the Total does not equal the sum of sectors.

BUSINESS-AS-USUAL PROJECTIONS

Community-wide GHG emissions were projected for the years 2020, 2035, and 2050 under a business-as-usual (BAU) scenario. The BAU scenario estimates future trends in each sector based on the San Diego Association of Governments (SANDAG) forecasts of population, housing, agricultural land, and employment for the County, and assuming that historic trends in energy consumption and waste generation continue. The BAU scenarios are what would be likely to occur without the implementation of a CAP or other GHG-reducing measures, like the Low Carbon Fuel Standard (LCFS); Pavley legislation, which covers passenger auto and light truck fuel efficiency; and the Renewable Portfolio Standard (RPS). State-level regulations, including those just listed, are included as part of CAP

strategies to achieve the County's targets, and are discussed in detail in Appendix C. Community-wide baseline and projected emissions are shown by sector in Table 2.3.

The County projected future community-wide emissions using land use data from the General Plan and use-specific emissions factors. Community-wide emissions would increase by approximately 680,109 MT CO₂e per year (15%) from 2005 to 2020, and by approximately 1,839,892 MT CO₂e per year (41%) from 2005 to 2035. Much of the increase is attributable to the anticipated growth in population and employment in the region (see Figure 2.2).

TABLE 2.3 | COMMUNITY BASELINE AND PROJECTED EMISSIONS

SECTOR	2005 BASELINE	2020 BAU	2035 BAU	2050 BAU
	(MT CO ₂ E)			
Transportation	2,636,702	3,098,307	4,004,966	4,785,555
Residential Energy	505,963	566,033	666,952	707,334
Commercial/Industrial Energy	615,687	737,916	818,698	934,503
Agriculture	190,025	159,246	118,134	83,520
Solid Waste	144,865	162,064	190,959	202,521
Wastewater	50,412	56,397	66,452	70,475
Potable Water	236,435	264,506	311,665	330,535
Other	132,490	148,220	174,646	185,221
Total¹	4,512,580	5,192,689	6,352,472	7,299,664
GHG Emissions per Service Population ²	7.47	7.48	7.80	8.23
GHG Emissions per Population	9.57	9.52	9.83	10.51

¹ Because of rounding, the Total does not equal the sum of sectors.

² Service population refers to the number of residents and employees in the region. This is often used to provide an equitable evaluation between regions with many employment or commercial centers versus many residential areas.

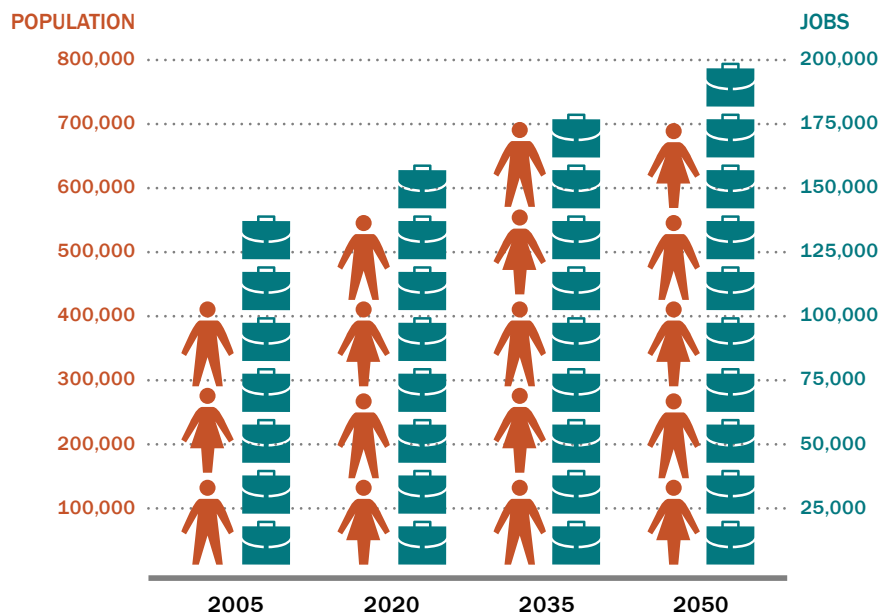
While projected emissions can vary based on a number of factors, including estimates of growth and economic conditions, forecasting emissions illustrates the anticipated emissions sources and quantities, which will allow for more informed planning choices. In the County, GHG emissions (see Table 2.3) associated with transportation are the largest source at the baseline year (2005) and are anticipated to increase over time. By 2020, transportation emissions are expected to account for 60% of emissions and increase to 66% by 2050. Commercial and industrial sources and residential emissions are expected to decline in relative contribution, while only agricultural emissions (4%) are expected to decline in absolute terms, due to fewer lands dedicated to agriculture in the future.

TABLE 2.4 | COUNTY GOVERNMENT GHG BASELINE AND PROJECTED EMISSIONS

SECTOR	2006	BAU 2020	BAU 2035	BAU 2050
	(MT CO ₂ E)			
Solid Waste Facilities	64,192	48,516	35,943	26,627
Employee Commute	57,572	63,017	70,776	73,893
Buildings and Facilities	55,291	61,420	67,987	75,256
Vehicle Fleet	23,231	24,960	27,428	28,611
Wastewater Facilities	11,656	13,451	16,232	17,661
Government-Generated Solid Waste	4,892	5,256	5,776	6,025
Public Lighting	2,160	2,493	3,008	3,273
Airport Facilities	1,153	1,331	1,606	1,747
Water	488	524	576	601
Total¹	220,633	220,968	229,331	233,695

¹ Because of rounding, the Total does not equal the sum of sectors.

FIGURE 2.2 | POPULATION AND JOB GROWTH



GHG EMISSIONS-REDUCTION TARGETS

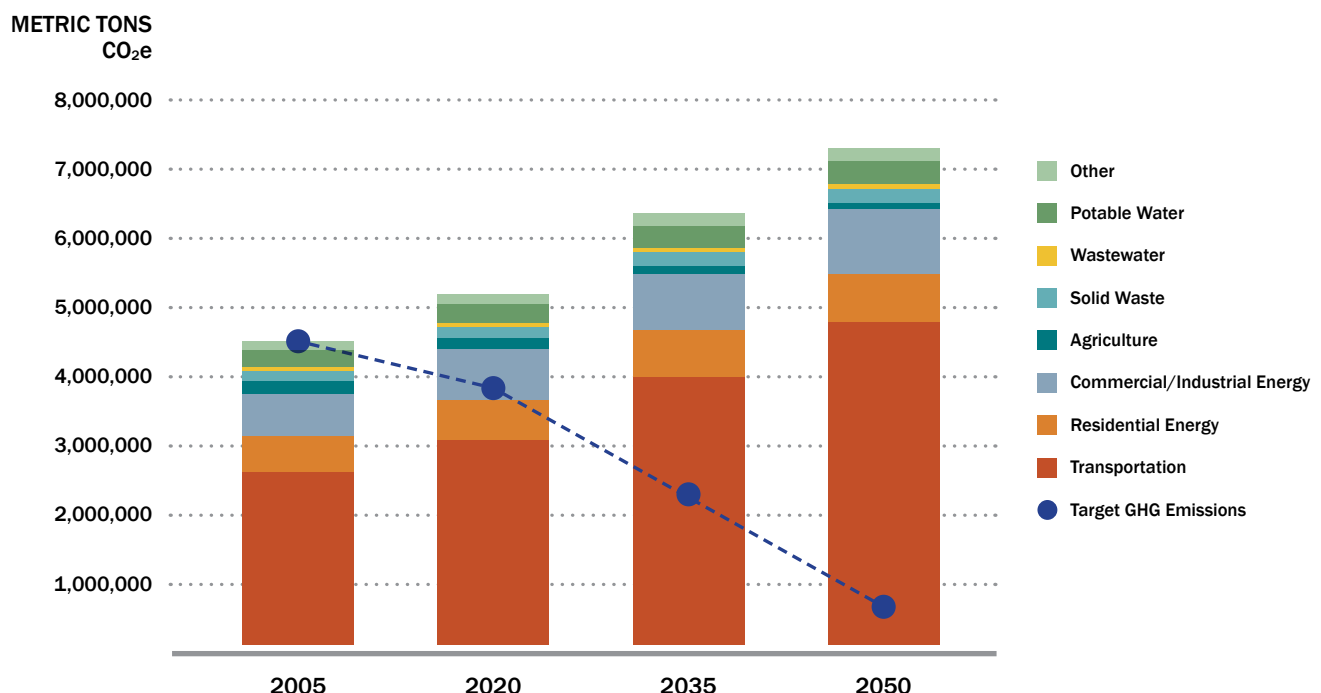
The County established a GHG emissions-reduction target of 15% below 2005 levels by 2020 (Figure 2.3), which aligns with the recommendation by the California Air Resources Board (ARB) and with the GHG emissions-reduction targets set by other local governments (see Table 1.1).

In addition, the County recognizes the goal established by Executive Order (EO) S-3-05, which calls for emissions reductions of 80% below 1990 levels by 2050. Therefore, the County developed emissions forecasts for

2035 and 2050 in order to demonstrate the BAU path for the County and the emissions reductions that would be needed to meet the 2050 goal. To be on the path toward that goal, the County would need to reach 49% below 2005 levels by 2035.

The following chapter details potential measures and actions that demonstrate how the County can achieve the 2020 reduction target and work toward the 2035 target.

FIGURE 2.3 | COMMUNITY BAU EMISSIONS AND EMISSIONS-REDUCTION TARGETS





Ch. 3

Community Measures and Actions

Emissions-reducing actions and objectives

were developed with reference not only to the regulatory requirements discussed in Chapter 1, but also with regard to the emissions profile of County residents. Annual per capita emissions in the County were 9.57 MT CO₂e in 2005. To meet the 2020 emissions targets, each resident of the County would need to reduce annual emissions by an average of 2 MT CO₂e to achieve emissions of just over 7 MT CO₂e per year. This goal can be reached with participation of County residents and businesses, through corporate partnerships and initiatives, and with government policies and programs. The County has demonstrated its ability to meet sustainability goals through effective planning in complying with the California Integrated Waste Management Act (AB 939). The latest County solid waste data (2006) indicates a 54% diversion rate, exceeding the 50% diversion rate set by AB 939. Through the diversion of solid waste, less waste is being sent to the landfills, extending their life and reducing the GHG emissions caused by waste decomposition. This high diversion rate was achieved and sustained through a process similar to that of the CAP, whereby the County

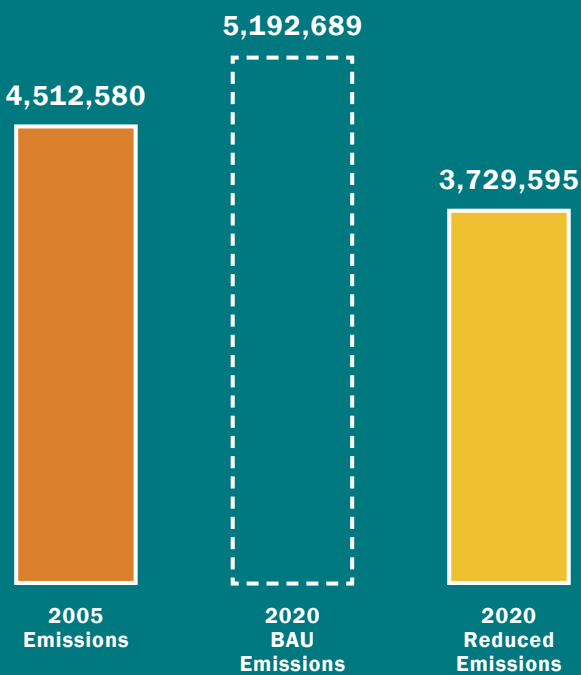
identified possible areas of action and worked with stakeholders to implement measures that increase waste diversion. This approach has proven successful as seen by the portfolio of 47 waste-diversion programs that assist and encourage County residents and businesses to recycle.

The goals and strategies recommended in the CAP establish the framework for meeting the 2020 target (see graphic on this page). The following sections detail strategies recommended to achieve emissions-reductions goals, which are both described and quantified where possible (see Measure Structure on page 23). Although most actions resulting from the CAP’s strategies will yield quantifiable emissions reductions, a select few will not. These strategies still merit discussion and monitoring as they are included as part of the County’s comprehensive approach to climate change.

In addition to the description and quantification, co-benefits are identified for each GHG reduction measure. Co-benefits are secondary benefits, those beyond GHG reductions, that are generally felt at a local or regional level. Examples of co-benefits include improved water quality from reduced fertilizer use, improved economy by creating green jobs, and improved public health through lowered vehicle emissions. The co-benefits identified in this CAP are displayed by icons described on the next page.

Table 3.1 on pages 24 and 25 summarizes each measure and its GHG reduction potential. By implementing the CAP, the County can achieve the goal of reducing emissions 15% below 2005 levels by 2020.

GHG reduction measures are shown by sector, including Water, Energy, Land Use and Transportation, Agriculture, and Landscaping and Open Space. Measure structure is shown on the following page and additional details are provided in Appendix B.



MEASURE STRUCTURE

Measure Name

Community Co-Benefits illustrate how the measure may positively impact other areas in the community. Below is a key to the icons that are shown in this section.

The measure description provides more detailed information about how the measure will be implemented.

Implementation Partners include some of the agencies, organizations, and County departments that will help realize the measure, while Performance Indicators explain the anticipated level of participation of each measure.

Cost and Savings list the monetary gains or losses and whether they would be realized by the private or public sector. The box below shows the category of cost and savings.

Potential Funding Sources include current sources of public and private funding. Funding sources change and should be verified at the time of implementation.

GHG Reductions are the anticipated level of reductions achieved in 2020 with full implementation of the measure.

W1 Water Conservation

IMPLEMENTATION

Implementation Partners: SDCEM, Local water districts and County Staff

Performance Indicator: 20% per capita reductions

COST: Very Low (Public)

County costs would consist of an existing outreach program costing less than \$20,000 to achieve water conservation goals.

SAVINGS: Very Low, Recurring (Private)

Approximately \$40 in annual savings per capita from avoided water purchases.

POTENTIAL FUNDING SOURCES

Partnerships with Other Jurisdictions and Organizations, American Recovery and Reinvestment Act (Energy Efficiency Conservation Block Grant)

Community Co-Benefits

GHG Reductions (MT CO₂e/Year)

20,200

In 2009, the state of California passed a package of legislation focusing on improving the quality and availability of water for residents and ecosystems of California. One part of this package was Senate Bill 7X7, which requires local water districts to reduce per capita water usage 20% by 2020. Using this state mandated reduction as a goal, the County has developed a strategy to work with the San Diego County Water Authority and other Local Water Districts that provide water to County residents to promote existing conservation programs, such as rebates for water efficient appliances and design assistance to help homeowners create water smart landscapes around their homes.

WATER CONSERVATION IS VITAL TO ENSURE THAT FUTURE GENERATIONS HAVE CLEAN AND ABUNDANT WATER

ECONOMIC ANALYSIS COST AND SAVINGS KEY

COST TO PRIVATE PARTIES (RESIDENTS, BUSINESSES, ETC.)

Very Low:	\$0–\$100
Low:	\$101–\$250
Medium:	\$251–\$500
High:	Over \$500

COST TO COUNTY

Very Low:	\$0–\$10,000
Low:	\$10,001–\$50,000
Medium:	\$50,000–\$100,000
High:	Over \$100,000

PRIVATE SAVINGS

Very Low:	\$0–\$100
Low:	\$101–\$250
Medium:	\$251–\$500
High:	Over \$500

CO-BENEFIT KEY



Improve
Water Quality



Reduce
Water Usage



Improve
Air Quality



Reduce
Energy Use



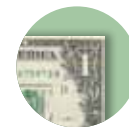
Increase
Habitat



Improve
Connectivity



Improve
Public Health



Improve Local
Green Economy

TABLE 3.1 | SUMMARY TABLE OF 2020 GREENHOUSE GAS REDUCTION MEASURES

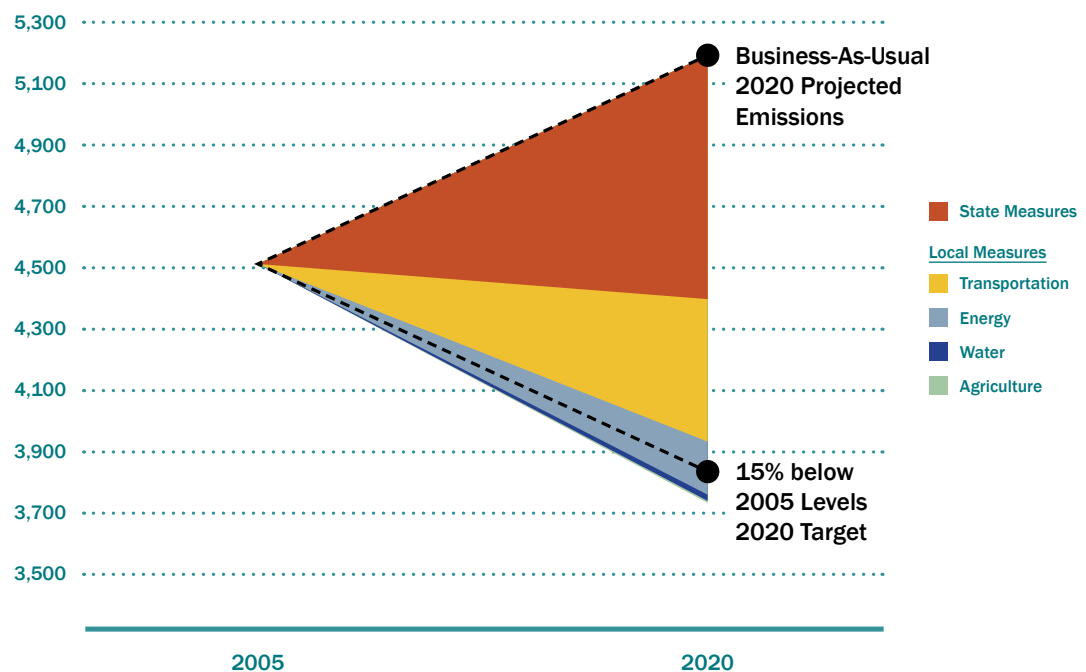
MEASURE NUMBER	MEASURE	ANNUAL MT CO ₂ E REDUCTIONS IN 2020	SCALED MEASURE PERFORMANCE (% REDUCTION IN GHG EMISSIONS)	ASSUMPTIONS	
				PARTICIPATION RATE	PERFORMANCE LEVEL
Water					
W1	Water Conservation	20,200	1.4%	100% of residents	20% per capita reductions
Energy					
E1	Energy-Efficient New Development	12,997	0.9%	10% until 2015, 100% after 2015	15% above Title 24 energy efficiency standards
E2.1	Residential Building Retrofits	27,999	1.9%	15% of pre 2002 residential units	Savings vary per residential type and building vintage
E2.2	Commercial Building Retrofits	5,257	0.4%	30% of pre 2002 commercial units	Reduce energy used for lighting by 40%
E3	Appliance Upgrades	20,060	1.4%	40% of existing homes and 95% of new homes	Average saving of 380 kWh per appliance and 32 kWh per light bulb replaced
E4	Smart Meters	8,880	0.6%	10% of residents with SDG&E accounts will utilize the enhanced energy monitoring capabilities to reduce energy usage	Reductions in energy consumption: Existing homes: 5% New homes: 6%
R1	Solar Water Heating (Residential and Commercial)	37,618	2.6%	19% of commercial and residential units	Reductions in energy used to heat water: Commercial: 59% Residential: 70%
R2	Alternative Energy Systems (Residential and Commercial)	45,290	2.9%	5% of residential and 8% of commercial energy will be supplied through renewable sources	10 watts per sq ft, 5 hrs per day
Land Use					
LU1	Mixed-Use Development	124,180	8.5%	25% of new development will occur in high density areas	4% reductions in VMT
Transportation					
T1	Increase Transit Use	62,090	4.2%	2% increase in transit ridership	2% reductions in VMT
T2	Increase Walking and Biking	93,135	6.4%	50% increase of bicycle and pedestrian facilities	3% reductions in VMT
T3	Increase Ridesharing	93,135	6.4%	50% of employers using TDM	3% reductions in VMT
T4	Alternative-Fuel Vehicles	93,135	6.4%	15% increase in electric vehicle purchase	3% reductions in VMT
Agriculture					
A1	Nitrogen Optimization	199	0.0%	5% of farmers reduce nitrogen usage	20% reduction in nitrogen fertilizer usage
A2	Field Equipment Fuel Efficiency	4,433	0.3%	35% of farmers increase fuel efficiency of equipment	15% increase in fuel efficiency of equipment
A3	Agriculture Irrigation Pump Efficiency	1,826	0.1%	40% of farmers increase efficiency of irrigation pumps	50% increase in efficiency of irrigation pumps

MEASURE NUMBER	MEASURE	ANNUAL MT CO ₂ E REDUCTIONS IN 2020	SCALED MEASURE PERFORMANCE (% REDUCTION IN GHG EMISSIONS)	ASSUMPTIONS	
				PARTICIPATION RATE	PERFORMANCE LEVEL
Landscaping and Open Space					
LS1	Plant Trees	2,475	0.3%	10,000 Trees planted	1,696 MT reduction from energy savings; 779 MT sequestration benefit
Total County Action		652,909	44.6%		
State and Federal					
SF1	Pavley – Passenger Auto and Light Truck Fuel Efficiency	416,210	28.4%	Regulatory	
SF2	Low Carbon Fuel Standard	175,075	12.0%	Regulatory	
SF3	Renewable Portfolio Standard	200,665	13.7%	Regulatory	
SF4	Tire Pressure Program	8,482	0.6%	Regulatory	
SF5	Heavy-Duty Vehicle Aerodynamics	9,753	0.7%	Regulatory	
Total State and Federal Action		810,185	55.4% ¹		
Total Reductions (County, State, and Federal Actions)		1,463,094	100%		
Percent Reduction below 2005 Baseline		17.4%			

¹ Figures may not total to 100% due to independent rounding.

THOUSAND
METRIC TONS
CO₂E PER YEAR

FIGURE 3.1 | 2020 GHG REDUCTION POTENTIAL BY SECTOR



WATER

Only 5% of the County's community-wide emissions are related to water use; however, because of the arid nature of San Diego's climate, conservation is vital to ensure that future generations have clean and abundant water.

Water-related GHG emissions are mainly generated by energy used to pump, transport, heat, cool, and treat water and wastewater. In San Diego County, only 18% of the water comes from local sources, with the rest coming from either the Sacramento Delta serving the State Water Project or the Colorado River. Because of the great distance this water travels to reach San Diego, it has high embedded energy and GHG emissions.



W1 Water Conservation



IMPLEMENTATION

Implementation Partners:

San Diego County Water Authority (SDCWA), local water districts, residents, businesses

Performance Indicator: 20% per capita reductions

COST: Very Low (Public)

An existing outreach program costing less than \$10,000 would achieve water conservation goals

SAVINGS: Very Low, Recurring (Private)

Approximately \$40 in annual savings per capita from avoided water purchases

POTENTIAL FUNDING SOURCES

Partnerships with other jurisdictions and organizations, American Recovery and Reinvestment Act (ARRA) (Energy Efficiency Conservation Block Grant [EECBG])

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

20,200

In 2009, the State of California passed a legislative package focused on improving the quality and availability of water for residents and ecosystems. Senate Bill 7X7, was included in that package and requires local water districts to **reduce per capita water usage 20% by 2020**. Using the state-mandated reduction as a goal, the County developed a strategy to promote existing conservation programs, like those offering rebates for water-efficient appliances and design assistance to help homeowners create water-smart landscapes around homes.

CONSERVATION IS VITAL
TO ENSURE THAT FUTURE
GENERATIONS HAVE CLEAN AND
ABUNDANT WATER

ENERGY

Residences and commercial operations in the County emit more than 1.1 MMT CO₂e each year through electricity and natural gas use. Projections of population and business growth in the County, together with the prospect of climate-change-induced heating and cooling demand increases, suggest that County energy demand is likely to grow in the future unless changes are implemented now. The primary ways to reduce GHG emissions generated through energy consumption are by increasing building efficiency and renewable resources providing alternative energy.

BUILDING EFFICIENCY

Investing in energy efficiency is a prudent decision for residents and businesses. Increasing a building's long-term performance can achieve lower operating costs, improve occupant comfort, hedge against utility price increases, and help improve air quality. Given that energy used to cool, heat, and power homes and businesses make up 25% of the County's GHG emissions and overall energy consumption, the County has focused many of its actions on building efficiency to help achieve its emissions-reduction goals by 2020.



E1 Energy-Efficient New Development



IMPLEMENTATION

Implementation Partners:

SDG&E, California Energy Commission (CEC), residents, businesses

Performance Indicator:

10% of new development exceed Title 24 standards by 15% until 2015 when measure becomes mandatory

COST: High, One Time (Private)

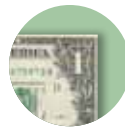
SAVINGS: Low, Recurring (Private)

Savings of approximately \$225 annually from improved efficiency

POTENTIAL FUNDING SOURCES

Partnerships with organizations, SDG&E, ARRA (EECBG), self-financing

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

Residential: **5,168**

Commercial: **7,829**

The newest edition of Title 24, California's Building Code, is intended to increase the energy efficiency of retrofits, renovations, and new construction. The County, in coordination with the California Energy Commission (CEC) and San Diego Gas and Electric (SDG&E), will **use incentives to encourage builders to exceed current energy efficiency standards by 15%**. In 2015, this higher standard will become a regulatory requirement for all new development. Developers and building owners can leverage the assistance provided by the County by also participating in other "green" building programs, such as the Leadership in Energy

and Environmental Design (LEED) or GreenPoint rating programs. By participating in these programs, builders and building owners will be able to add value to their projects and increase the benefits of building green. The County's Green Building Incentive program is designed to decrease the time and cost of build green projects. There are also educational programs led by other organization that work with builders to educate them about green building principles and practices. Some examples of these programs are the San Diego Green Building Apprenticeship Readiness Partnership led by the San Diego Workforce Partnership

and the San Diego Green Building Training Collaborative, which is taught by Grossmont-Cuyamaca Community College District. These are just two of the many on-going workforce development programs that will help create the educated and experienced workforce that is needed to take advantage of the County's Green Building Incentive program.

E2.1 Residential Building Retrofits



IMPLEMENTATION

Implementation Partners:
SDG&E (Energy Upgrade California), CCSE (Energy Upgrade California), residents, businesses

Residential Performance Indicator:
Retrofit 15% of existing buildings

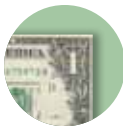
COST: High, One Time (Private)

SAVINGS: Low, Recurring (Private)
Average savings of approximately \$250 per year per retrofit

POTENTIAL FUNDING SOURCES

ARRA (EECBG), CEC Energy Efficiency Financing, other public finance (Qualified Energy Conservation Bonds [QECBs])

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

27,999

Of the total GHG emissions in the County, 25% are a result of energy used for commercial and residential buildings. Having affordable energy to heat and cool buildings, turn on lights, wash clothes, cook food, run computers, and support the daily functions of home, work, and commerce is essential to a functioning regional economy. Since the vast majority of buildings in the County were built before 2002, there is tremendous potential to increase the overall energy efficiency of buildings in the region with a range of energy efficiency upgrades.

There are a range of state and federal incentives to help promote

and fund energy efficiency upgrades. Energy Upgrade California, a statewide program to help homeowners retrofit and renovate homes with more energy-efficient appliances, heating/cooling systems, and other improvements, lowers the cost barrier by offering rebates based on percent increase in energy efficiency. Retrofits are generally done as part of a “package” of options such as sealing leaks in air conditioning/heating systems and installing insulation in the walls and ceilings.

Using \$3 million provided by the U.S. Department of Energy through

the CEC, the County has created a comprehensive residential building energy retrofit program for the region. This program will encourage energy efficiency retrofits of single- and multi-family residential properties, with a focus on economically disadvantaged communities. This program is designed to **maximize participation in existing energy efficiency retrofit programs in the County** such as the Energy Upgrade California program or SDG&E’s Energy Savings Assistance Program. By working with partners such as the California Center for Sustainable Energy (CCSE), SANDAG, and SDG&E, who are already operating

energy efficiency programs in the San Diego area, the County can focus its resources on providing the information and assistance residents need to take advantage of existing programs. Participating in these existing programs will help the residents improve the efficiency, comfort, health, and value of their homes.

THERE IS
TREMENDOUS
POTENTIAL
TO INCREASE
THE OVERALL
ENERGY
EFFICIENCY OF
BUILDINGS IN
THE COUNTY
WITH A RANGE
OF ENERGY
EFFICIENCY
UPGRADES.

E2.2 Commercial Building Retrofits



IMPLEMENTATION

Implementation Partners:

SDG&E, CCSE, residents, businesses

Performance Indicator:

Retrofit 30% of existing businesses

COST: High, One Time (Private)

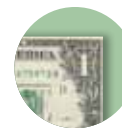
SAVINGS: Medium-High, Recurring (Private)

Savings from lighting retrofit can reduce operation costs by up to 40% of current costs in commercial buildings, depending on building type and existing lighting system

POTENTIAL FUNDING SOURCES

ARRA (EECBG), partnerships with organizations (CCSE), SDG&E Local Government Partnership

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

5,257

Businesses can gain long-term savings from upgrading ceiling and duct insulation; installing an Energy Management System (EMS) that controls air conditioning, heating, and lighting systems, and operates efficiently when needed and shuts off when not needed; converting to light-colored roofs; or simply using more efficient lighting fixtures and bulbs. According to the Database for Energy Efficiency Resources (DEER), a basic energy efficiency package for commercial buildings includes a reset/calibration of chilled and hot water systems, addition of heating and cooling time-clocks, and reduced nighttime lighting levels. SDG&E currently offers assistance

and incentive programs such as the Savings by Design, Direct Install, Rebate, and On-Bill Financing programs to help commercial customers make energy efficiency improvements. County staff currently display all collateral and marketing materials provided by SDG&E, which provides business owners a “one-stop shop” to learn what SDG&E programs can benefit them. With funding from Energy Efficiency and Conservation Block Grants (EECBG), the County is also working to re-start the Green Business Program. **These efforts will help businesses to take advantage of existing energy efficiency programs and reduce their energy usage.** Because of the

amount of older, inefficient lighting systems, and because of the SDG&E programs already in place to assist business owners in upgrading their old equipment to energy efficient technology, it is assumed that the bulk of energy efficient upgrades would come from the lighting sector. To help facilitate this conversion, the County is using other EECBG funds to partner with SDG&E, and has conducted various recycling programs focused on fluorescent lamps. By giving business owners the option to recycle older, inefficient lamps, the County is making it easier to upgrade to newer technology.

E3 Appliance Upgrades



IMPLEMENTATION

Implementation Partners:

SDG&E, residents, businesses

Performance Indicator:

Energy Star appliances in 40% of existing homes and 95% of new homes

COST: High, One Time (Private)

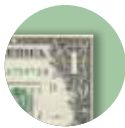
Energy-efficient Energy Star appliances are more expensive than standard appliances. On average, a package composed of a refrigerator, dishwasher, clothes washer, and ceiling fan with the Energy Star certification will cost about \$390 more than a standard appliance package.

SAVINGS: Very Low, Recurring (Private¹)

POTENTIAL FUNDING SOURCES

ARRA (EECBG), partnerships with organizations (SDG&E), SDG&E Local Government Partnership

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

Existing Homes: **14,680**

New Homes: **5,380**

According to the United States Environmental Protection Agency (USEPA), devices that have an Energy Star certification, such as office equipment, home appliances, and lighting products, generally use 20% to 30% less energy than required by federal standards. With more Energy-Star-rated home and business appliances, County residents can help to reduce GHG emissions compared to the use of older, less efficient appliances. This measure assumes **refrigerators, dishwashers, clothes washers, and light bulbs would be upgraded to Energy-Star-rated appliances**. However, it should be noted that upgrades to other Energy Star appliances such as

air conditioning units, computers, televisions, and photocopiers would augment the estimated reductions. The County will promote SDG&E's existing work to increase community awareness of rebate and incentive programs, the efficiencies that may be gained from Energy-Star-rated appliances, and the cost savings associated with Energy Star appliances.

¹Appliances in the home are major users of energy, and using Energy Star appliances, which are rated for efficiency by the United States Environmental Protection Agency, can help to reduce residential energy consumption and energy bills. By using a refrigerator, dishwasher, clothes washer, and ceiling fans with the Energy Star certification, households can reduce their electricity bills by about \$450 over the lifetime of the appliances, even after paying back the difference in purchase price over standard appliances. Across the County, this results in almost \$16 million in savings during the lifetimes of the appliances.

E4 Smart Meters



IMPLEMENTATION

Implementation Partners:

SDG&E, residents, businesses

Performance Indicator:

10% of residents use Smart Meters to reduce energy consumption

COST: Very Low to High, One Time (Private)

SAVINGS: Very Low to High, Recurring (Private)

Savings of about \$20 per month per household after monthly cost of equipment; savings of about \$175 million annually across all commercial buildings, not including equipment fees of \$500 per commercial installation

POTENTIAL FUNDING SOURCES

Partnerships with organizations (SDG&E), SDG&E Local Government Partnership

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

Existing Homes: **1,993**

New Homes: **6,887**

Emerging energy management systems, such as Smart Meters, have been installed by SDG&E throughout its service territory and this has significantly improved how electricity consumption is managed for building climate control, appliances, and all other uses. These new Smart Meters will eventually provide utility customers with access to detailed, instantaneous energy use and cost information; new dynamic pricing programs based on peak-energy demand; and the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort, and convenience. The County will promote the efforts of SDG&E, other

jurisdictions, and organizations to **accelerate “Smart Grid” integration in the community.** The true value of the Smart Meter program will be fully realized when community residents and businesses begin accessing and utilizing this information to make more informed energy-use decisions based on the two-way communication enabled by these meters. For example, Smart Meters will allow a homeowner to program the washing machine to run when energy is cheapest. Customers will have access to their daily energy usage through the My Account feature on SDG&E’s website, which will help increase awareness and, thus, reduce consumption and energy costs.

THIS HAS
SIGNIFICANTLY
IMPROVED HOW
ELECTRICITY
CONSUMPTION
IS MANAGED
FOR BUILDING
CLIMATE
CONTROL,
APPLIANCES,
AND ALL
OTHER USES.

INCREASE RENEWABLE ENERGY GENERATION

Green building and net-zero energy practices are creating a new framework for how energy is used in homes and businesses. Net zero refers to the idea that buildings consume no more energy than they produce on-site and produce no annual energy emissions. This is accomplished through three key methods: reducing the building's overall energy demand by using energy-efficient appliances (e.g., heating, ventilation, and air conditioning [HVAC] units; washers and dryers); creating an energy-efficient building envelop with properly sealed doors, windows, and ducts; and installing renewable energy technologies such solar water heaters and solar panels. The result is a building that can produce as much energy as it consumes. While the measures in this chapter are focused on the most prevalent renewable systems, solar

photovoltaic (PV) and solar hot water, there are other opportunities to generate clean renewable energy, such as large- and small-scale wind power. To assist residents and businesses in developing wind power, the County created a zoning ordinance that lays out the review and steps that property owners must take to produce wind power on their properties. These smaller scale renewable energy developments will work with more established technologies to help the County reach its emissions-reduction goals. It is important to note that this CAP only evaluates proven and cost-effective technologies that are currently in the marketplace; there is a chance that a technological breakthrough will enable future renewable energy systems to be installed at a faster pace than is forecasted in this document.



R1 Solar Water Heating (Residential and Commercial)

RESIDENTIAL

COST: High, One Time (Private)

Solar water heaters are more costly than traditional water heaters, although state incentives help to reduce the larger upfront cost. On average, the state incentive for solar water heaters offsets the cost of purchase and installation by about \$1,050, which reduces the difference in cost from traditional water heaters to just over \$5,500.

SAVINGS: Low, Recurring (Private)

By using renewable energy to heat water, solar water heaters provide an efficient solution to water heating needs that are a major component of utility costs for households. Solar water heaters save enough money to pay for their higher installation and purchase costs, and save more than \$2,600 over their lifetimes. Across the County, households will save more than \$5.6 million.

COMMERICAL

COST: High, One Time (Private)

SAVINGS: High, Recurring (Private)

Institutional systems generally provide about 40% to 80% of water heating needs.

IMPLEMENTATION

Implementation Partners:

CCSE, SDG&E, residents, businesses

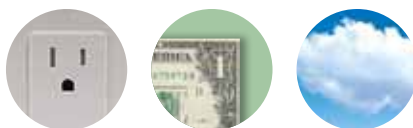
Performance Indicator:

Solar water heating systems on 19% of residential commercial buildings

POTENTIAL FUNDING SOURCES

Public finance (Clean Renewable Energy Bonds [CREBs]), partnerships with private companies (Power Purchase Agreements [PPAs], Energy Performance Contract with Energy Service Provider [ESP]), partnerships with organizations

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

Residential: **21,496**
Commercial: **16,122**

Solar hot water systems are a simple, reliable, and cost-effective method for harnessing the sun's energy to provide for hot water needs. Solar collectors, usually placed on the roof, absorb the sun's energy to heat water that is stored in a water tank. According to the California Solar Initiative, a statewide effort to promote solar hot water systems through outreach, education, and incentives, solar hot water systems can lower water heating costs by meeting 50% to 80% of hot water needs over a year. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470) created a 10-year program aimed at installing solar water heaters in

homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000 to \$6,000. **The County will support the California Solar Initiative's Solar Water Heating Incentive program to replace and recycle water heaters in homes and commercial buildings.** Although solar water heater upgrades require an up-front investment from the resident or business owner, there are a range of financing and rebate options to offset these initial investment costs.

R2 Alternative Energy Systems (Residential and Commercial)

RESIDENTIAL

COST: One Time (Private); Low to High, Recurring (Public)

Private: Average cost to install a 4.2-kilowatt (kW) system, the average size system, in San Diego is about \$32,550, including CSI and County incentives. Public: The County has waived the approximately \$200 to \$325 in fees per system since 2002, and has waived more than \$750,000 in fees since that date.

SAVINGS: Medium, Recurring (Private)

Solar PV systems generate renewable electricity that is used to offset the electricity consumed by households. Although these systems are relatively costly to install, they can pay for themselves and save money on electricity bills. Over a 30-year lifespan, a solar PV system can save about \$14,000 after paying for themselves, and incentives from the state and County have averaged over \$6,500.

COMMERCIAL

COST: High, One Time (Private)

SAVINGS: High, Recurring (Private)

Savings vary based on system size, but typically larger commercial systems earn positive returns more quickly than smaller residential installations.

IMPLEMENTATION

Implementation Leads:

CCSE, SDG&E, residents, businesses

Residential Performance Indicator:

Generate 5% of existing residential electricity

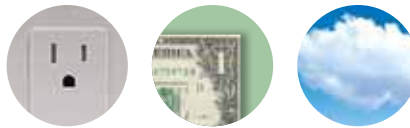
Commercial Performance Indicator:

5.5 million square feet of PV installed

POTENTIAL FUNDING SOURCES

Partnerships with private companies (PPAs) and other organizations (CCSE), SDG&E Local Government Partnership, public finance (CREBs), existing rebates and incentives

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

Residential: **16,821**

Commercial: **28,469**

Alternative energy systems include wind, solar, and geothermal sources to provide low-GHG-emission energy. Many of these systems are being installed in the region as part of SDG&E's compliance with the Renewable Portfolio Standard, while smaller systems are being installed to provide on-site alternative energy to homes and businesses. All are potential resources for the community, and increased use is encouraged by the County; however, solar PV systems are the most common. PV systems generate electrical power by converting solar radiation into direct-current electricity using semiconductors. PV systems can

be retrofitted into existing buildings, usually by mounting them on an existing roof or walls. According to the California Solar Initiative (www.californiasolarstatistics.org), there are currently approximately 1,420 solar PV installations in the County, with a total capacity of approximately 15 megawatts (MW). **The County is promoting PV solar panels as a way for residents to generate clean, renewable energy.** Currently, the County offers support in the form of reduced fees and expedited permits. Because the funding for these PV preferential programs is tied to EECBG funds, they will expire in 2012.

LAND USE AND TRANSPORTATION

The single largest sector contributing to GHG emissions within the County is transportation. The 2.6 million MT CO₂e accounts for more than 59% of the community's emissions, which are derived from on- and off-road vehicle use. To ensure emissions reductions goals are met, this is an area where the most significant reductions must take place.

Reducing vehicles miles traveled (VMT) and replacing older vehicles with more fuel-efficient options are two strategies that will generate significant emissions reductions.

The County can also work with local businesses to expand access to alternative means of travel through actions such as providing additional bike lanes, increasing access to bus and trolley lines, installing recharge stations for

electric vehicles, and increasing park and ride centers. The County can work with other agencies' transportation departments to ensure traffic control efficiency and increase the attractiveness of alternate means of travel through charging for parking to encourage ride sharing or use of mass transit.

An added challenge to reducing VMT in the County results from the significant growth forecast for the coming decades. Given this challenge, planning to ensure use of energy-efficient resources is essential. Under the County's General Plan, the County calls for mixed-use, higher density development near service centers in high-growth areas, which will reduce VMT by locating homes, schools, and businesses near commerce.



LU1 Mixed-Use Development



IMPLEMENTATION

Implementation Partners:

SANDAG and County staff, Department of Planning and Land Use (DPLU)

Performance Indicator:

4% decrease in vehicle miles travelled (VMT)

COST: None

County use of regulatory, not financial, incentives

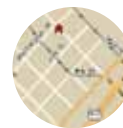
SAVINGS: Medium, Recurring (Private)

Per capita savings of about \$300 annually from avoided driving costs

POTENTIAL FUNDING SOURCES

State and regional grants (California Department of Transportation [Caltrans] Planning Grants), partnerships with organizations

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

124,180

Increasing the availability, effectiveness, and use of transit could result in a 4% reduction in overall VMT in the County by 2020. Using the General Plan as a tool to reduce transportation emissions, the County adopted specific language that will promote mixed-use, high-density, and transit-oriented development in appropriate locations. However, because this measure will only change the composition and location of future development and redevelopment, the estimated reduction in VMT and emissions come only from decreases in new VMT generated by these projects. To meet the GHG reduction target,

the County will create additional incentives to encourage new mixed-use development near existing and planned transit corridors. These additional incentives might include reductions in parking, expedited permitting, reductions in fees, or other similar measures that would be finalized through an update of the County's regulations related to the processing and approval of development proposals. With a combination of new planned developments, existing commercial center retrofits, and mixed-use infill development, the County can increase access to goods and services, and options to reach those amenities, thereby reducing

the need for automobile trips. An important co-benefit of incentivizing growth in higher density areas around transportation facilities is the preservation of open space. A majority of the land in the unincorporated area of the County is open space or undeveloped and includes large tracts of federal, state, or regional parklands, and agricultural production areas.

T1 Increase Transit Use



IMPLEMENTATION

Implementation Partners:

San Diego Association of Governments (SANDAG), Metropolitan Transit System (MTS), and County staff

Performance Indicator:

2% decrease in VMT

COST: Very Low (Public)

Public costs to improve transit facilities, such as bus stops, and expand County rideshare program

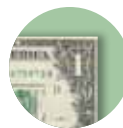
SAVINGS: Low, Recurring (Private)

Per capita savings of \$150 annually from avoided driving costs

POTENTIAL FUNDING SOURCES

State and regional grants (Caltrans Planning Grants), partnerships with organizations

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

62,090

Because the County is composed primarily of suburban and rural communities, there is limited access to, and facilities to support, regional transit operated by the Metropolitan Transit System (MTS). The transit system operated by MTS includes three trolley lines (with a total of 53 miles of track) and 89 fixed bus routes. With development guided by the newly adopted General Plan, it is assumed that more development will occur near existing and planned transit locations. Locating development close to public transit will encourage residents to use these services for daily activities. The County will also encourage SANDAG and MTS to **develop new transit facilities where densities permit and to improve the existing facilities** (mainly

existing stations and stops). The County will also work with developers to ensure that all transit facilities required by building ordinances are built. By improving existing transit facilities, SANDAG and MTS will be able to make the transit experience more convenient and appealing to County residents. Combined with facility improvements, these efforts will **expand transit ridership within the County**. Given the potential for increased ridership, County-wide VMT could be reduced by 2% by 2020.

LOCATING
DEVELOPMENT
CLOSE TO
PUBLIC
TRANSIT WILL
ENCOURAGE
RESIDENTS
TO USE THESE
SERVICES
FOR DAILY
ACTIVITIES.

T2 Increase Walking and Biking



IMPLEMENTATION

Implementation Partners:

SANDAG and County staff (DPLU and Department of Public Works [DPW])

Performance Indicator:

50% increase in bicycle and pedestrian facilities

COST: Varied

Costs to install 92.5 miles of bike and pedestrian paths vary based on the type of paths chosen, but costs per mile range from \$14,800 per 1 mile for a Class III facility to \$2.6 million per 1 mile for a Class I facility.

SAVINGS: Medium, Recurring (Private)

Per capita savings of nearly \$220 annually from avoided driving costs

POTENTIAL FUNDING SOURCES

State and regional grants (Caltrans Planning Grants), partnerships with organizations

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

93,135

Walking or biking in place of driving reduces GHG emissions, increases personal fitness, and adds to the sense of community as more people interact on sidewalks and bike paths. A number of actions can facilitate walking and biking, as identified below.

The County has adopted Pedestrian Area Plans for portions of five unincorporated communities. Pedestrian Area Plans look at existing pedestrian conditions, identify deficiencies, and recommend solutions. As more Pedestrian Area Plans are prepared in unincorporated communities, they will collectively form the Pedestrian Master Plan. The County also worked with SANDAG to create the “Riding to 2050, San Diego Regional Bicycle Plan,” which is intended to guide the development of

the regional bicycle system by creating interconnected bicycle corridors, support facilities, and programs to make bicycling more practical and desirable to a broader range of people within the County.

Based on the General Plan, Pedestrian Area Plans, and the Regional Bicycle Plan, the County will widen existing sidewalks, complete gaps in the sidewalk network, and extend existing sidewalks to provide access to desired areas. **These efforts will be focused on expanding the pedestrian network to make walking an attractive travel mode.**

The County will also encourage bicycle travel by **developing and implementing off-street bicycle trails** that can be used for recreational travel and commuting purposes. These off-street trails will allow

residents to cycle safely, which will make cycling a more attractive transportation option for cyclists of all levels of expertise. In addition to any facilities that will be developed directly by the County, the County will also coordinate with private development to ensure that facilities are constructed in and adjacent to new development/redevelopment, where appropriate. Another way to promote awareness of bicycling as an alternative means of transportation and encourage road-sharing between bicycles and motorized vehicles is to develop a promotional and awareness campaign for both drivers and cyclists to encourage cyclists and make drivers aware of cyclists.

T3 Increase Ridesharing



IMPLEMENTATION

Implementation Partners:

SANDAG and County staff

Performance Indicator:

50% of employers using transportation demand management

COST: Very Low (Private); Very Low (Public)

Public costs to promote programs; private costs of telecommuting and transit include home electricity and unreimbursed share of transit passes

SAVINGS: Low, Recurring (Private)

Per capita savings of about \$300 annually from avoided driving costs

POTENTIAL FUNDING SOURCES

State and regional grants (Caltrans Planning Grants), partnerships with organizations

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

93,135

Transportation demand management (TDM) is a series of strategies that aim to reduce single-occupancy automobile trips. These strategies frequently target commute trips associated with employment. Private industry employs the majority of employees who work within the County. To facilitate a change in commuting patterns, **the County will encourage private industry to incorporate TDM emissions-reduction measures in the workplace through outreach that would be conducted by County staff.** It is anticipated that this outreach could be implemented through existing forums involving business owners and operators. Under this measure, private employers would be encouraged, but not required, to

implement a TDM program for their employees, including incentivizing transit use or implementing a rideshare program. **The County will showcase the current local government program as an example, and encourage additional TDM at existing and future businesses.** Where feasible, the County would expand the shuttle network to accommodate additional ridership. This strategy would focus on County staff and what they can do to reduce their use of automobiles to travel to and from County offices. These changes would equate to a 3% County-wide reduction in VMT by 2020.

THIS STRATEGY WOULD FOCUS ON COUNTY STAFF AND HOW THEY CAN REDUCE THEIR USE OF AUTOMOBILES TO TRAVEL TO AND FROM COUNTY OFFICES.

T4 Alternative-Fuel Vehicles



IMPLEMENTATION

Implementation Partners:

Ecotality, CCSE, SDG&E, and County staff

Performance Indicator:

15% increase in electric vehicle purchase

COST: High (Private)

Purchase price is higher than comparable vehicles in the same class by approximately \$14,000

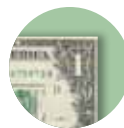
SAVINGS: None by 2020 (Private)

Just under \$600 in operational savings, but no net savings by 2020 due to high purchase cost

POTENTIAL FUNDING SOURCES

Partnerships with organizations (SANDAG, CCSE, SDG&E, Ecotality)

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

93,135

Hybrid and electric vehicles emit fewer GHGs than gasoline- and diesel-powered vehicles, and their use could help lower GHG emissions. While some transition to alternative vehicles is accounted for in projections at the state and regional (SANDAG) levels, the County is currently participating in a program that is being implemented by Ecotality and funded by agencies such as the U.S. Department of Energy, SANDAG, and SDG&E to further increase the number of electric vehicles in the community. A key component of this effort is to **facilitate the purchase and use of electric cars through installation of chargers at various public sites**. This is designed to overcome one of the

limitations of electric vehicles: their limited range. As another part of this strategy, the County would provide outreach to encourage purchase and use of electric cars by residents and employees living and working in the unincorporated areas of the County and using County facilities. This strategy will focus solely on an expansion of electric vehicles so that there will be limited overlap with programs that encourage use of hybrid vehicles and other alternative-fueled vehicles that are being implemented by the State of California and the U.S. government.

HYBRID AND
ELECTRIC
VEHICLES
EMIT FEWER
GHGS THAN
GASOLINE-
AND DIESEL-
POWERED
VEHICLES, AND
THEIR USE
COULD HELP
LOWER GHG
EMISSIONS.

AGRICULTURE

While GHG emissions from the County's agricultural sector are relatively minor, it is important to maximize emissions reductions from all available sectors. To leverage existing programs and minimize program implementation costs, these measures will be implemented by existing staff already working with farmers in the County. This will include farm advisors from the Farm and Home Advisor, which is a collaboration among the County; the U.S. Department

of Agriculture; the University of California; the San Diego County Farm Bureau; and the County's Department of Agriculture, Weights, and Measures. These measures will complement existing program goals by helping to minimize the resources that are required from County farmers, which will help farmers reduce costs and increase the profitability and sustainability of agriculture in the County.



A1 Nitrogen Optimization



IMPLEMENTATION

Implementation Partners:

San Diego Farm Bureau and County staff (the Farm and Home Advisor and Department of Agriculture, Weights, and Measures)

Performance Indicator:

5% of farmers decrease nitrogen usage

COST: None

SAVINGS: Low, Recurring (Private)

Approximately \$230,000 in savings County-wide to 2020

POTENTIAL FUNDING SOURCES

This measure would leverage existing outreach

Community Co-Benefits

GHG Reductions (MT CO₂e/Year)



199

Using organic or mineral nitrogen fertilizers is essential to maintain soil fertility and provide profitable yields. While these fertilizers are necessary, excessive application generates large amounts of nitrous oxide, a potent GHG. The purpose of this measure is to reduce nitrogen fertilizer use by providing information to farmers about optimizing nitrogen application rates, decreasing fertilizer input costs, maintaining crop yields, and decreasing nitrous oxide emissions. Working through the existing programs mentioned above, the County will **educate farmers about the advantages of reducing nitrogen fertilizer, with a goal of reducing use by 20%.**

This effort will use the most recent techniques to maintain crop yields and ensure that County farmers still benefit financially.

THIS EFFORT
WILL USE THE
MOST RECENT
TECHNIQUES
TO MAINTAIN
CROP YIELDS
AND ENSURE
THAT FARMERS
BENEFIT
FINANCIALLY.

A2 Field Equipment Fuel Efficiency



IMPLEMENTATION

Implementation Partners:

San Diego Farm Bureau and County staff (the Farm and Home Advisor and Department of Agriculture, Weights, and Measures)

Performance Indicator:

35% of farmers increase fuel efficiency of field equipment

COST: None

SAVINGS: Very Low, Recurring (Private)

Approximately \$400 in savings per farm to 2020

POTENTIAL FUNDING SOURCES

This measure would leverage existing outreach.

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

4,433

Farms use a considerable amount of fossil fuel within their field operations. Routine maintenance and more efficient equipment operation can provide valuable fuel savings. Engine and equipment upgrades are also expected to increase fuel efficiency. The County will incorporate information about on-farm fuel efficiency into existing outreach and education efforts that are underway through the various agriculture resources. This will ensure that farm equipment is in top operating condition, which will save fuel and money, and help reduce repair costs, improve equipment reliability, and reduce harmful exhaust emissions.

ROUTINE
MAINTENANCE
AND MORE
EFFICIENT
EQUIPMENT
OPERATION
CAN PROVIDE
VALUABLE FUEL
SAVINGS.

A3 Agriculture Irrigation Pump Efficiency



IMPLEMENTATION

Implementation Partners:

San Diego Farm Bureau and County staff (the Farm and Home Advisor and Department of Agriculture, Weights, and Measures)

Performance Indicator:

40% of farmers increase fuel efficiency of irrigation pumps

COST: High (Private)

Approximately \$9,000 to purchase and install a variable-speed, 20-horsepower agricultural pump without rebates (information on rebates available through the San Diego Farm Bureau)

SAVINGS: Medium (Private)

Savings per farm of about \$3,200 in electricity (not including water) through 2020

POTENTIAL FUNDING SOURCES

SDG&E (Incentives)

Community Co-Benefits



GHG Reductions (MT CO₂e/Year)

1,826

Diesel, natural gas, and electric irrigation pumps are used to pump groundwater from agricultural wells and return irrigation tail water for reuse in fields. This measure proposes reducing irrigation emissions associated with pumping water by **increasing the efficiency of irrigation pumps**. Routine repairs to pump bowl components can decrease pump energy use by one-third. Using the same existing outreach as the other two agriculture measures, the County will provide information through already established programs about incentives and advantages of increasing irrigation pump efficiency.

ROUTINE
REPAIRS
TO PUMP
COMPONENTS
CAN DECREASE
PUMP ENERGY
USE BY
ONE-THIRD.

LANDSCAPING AND OPEN SPACE

LS1 Plant Trees



IMPLEMENTATION

Implementation Partners:

CCSE's Advice and Technical Assistance Center (ATAC) for Urban Forestry, County staff (DPW), residents, businesses

Performance Indicator:

10,000 trees planted

COST: Medium, One Time (Private)

Initial purchase cost of about \$110, and just under \$350 for irrigation, trimming, and pest control over a 40-year tree lifetime

SAVINGS: Low, Recurring (Private¹)

POTENTIAL FUNDING SOURCES

State and regional grants (CalFire Climate Change Program, California ReLeaf), partnerships with private companies and other organizations

Community Co-Benefits








GHG Reductions

(MT CO₂e/Year)

2,475

The County recognizes trees as a valuable asset that will provide GHG-reduction benefits and many other co-benefits that will improve the quality of life for all County residents. This measure will encourage residents to plant trees near their home so they can benefit from the shade of the tree in the summer. This shade will decrease the cooling load of a home and allow the resident to reduce electrical usage. Over the lifespan of the tree, this reduction in energy costs will save the homeowner more than \$1,000. To assist residents and business in planting trees around their buildings, the California Center for Sustainable Energy created the Advice and Technical Assistance Center (ATAC)

for Urban Forestry, which has a full catalog of educational information about tree planting. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide greater amounts of shade, which results in a higher capacity for building cooling in hot weather. To maximize energy savings from shade trees residents and businesses will need to plan what type of trees will be planted and where they will be planted so that the shade will provide cooling in the summer but not prevent the sun from heating the building in the winter. For further information see the “planting guide” in Appendix A. Additionally, trees gain carbon-capturing

biomass in their trunks and roots as they absorb carbon from the air to grow. The trees will also provide the County with increased water and air quality, increased habitat for wildlife, decreased urban heat island effect, and beautification of County neighborhoods.

¹Because trees planted near homes provide shade, they can lower home utility bills by keeping homes in the shade cooler than those that receive direct sun, especially in the afternoons. In addition to the other benefits of planting trees, like improving air quality and increasing real estate value, trees can pay for themselves and lower home utility bills by about \$1,060 over their lifetimes.

2035 REDUCTIONS

The County acknowledges Executive Order S-3-05, which sets a GHG-emissions-reduction goal of 80% below 1990 levels by 2050. While this is not a binding mandate, the County is committed to creating a healthy, energy-efficient, and sustainable future for its residents and visitors, and the County recognizes that the need to reduce GHG emissions will not end in 2020. Therefore, as stated in Chapter 2, the County developed an emissions-reduction goal for 2035 that would put the County on the path toward the 2050 goal. To be on track to meet the state's emissions goal for 2050, the County determined that emissions reductions of 49% below 2005 levels would be necessary by 2035.

Similar to the 2020 analysis, the County developed a framework for reducing emissions by 2035 that would work in the context of the unincorporated County. The measures developed for the 2020 scenario were also used in the 2035 scenario, but with increased rates of participation. Maintaining the measures developed for 2020 reduces the cost of implementing new measures and builds on existing outreach structure, yielding higher participation over time. In addition, it is anticipated that technology will improve and/or lower in cost, making the measures more feasible for a greater percentage of the population in the future. For example, Measure E 2.1, Residential Building Retrofits, assumes a feasible participation rate of 15% by 2020, but increases to 90% by 2035. Assuming aggressive, but feasible, goals, Table 3.2 shows the actions, assumptions, and reduction potential by measure that the County would achieve by 2035. The potential reductions total 2,456,619 MT CO₂e, or 13.7% below 2005 levels, as shown in Figure 3.2.

While this does not achieve the 49% reduction target, it is important to note that the assumptions in the 2035 scenario include only current technology and existing state and federal regulations. There are likely to be advances in technology that cannot be accounted for now, as well as additional regulations that will enhance the reductions achieved at the state and federal levels by 2035. In the 2020 scenario, state and federal actions account for more than 55% of the reductions needed to achieve the 2020 goal, whereas they account for only 34% of the reductions needed to achieve the 2035 goal.

Meeting GHG-reduction goals beyond 2020 will require even greater participation in existing measures, inclusion of additional measures, guidance from state and federal authorities, additional state and federal regulations, improved technology, and infrastructure changes. As described in Chapter 6, the CAP will be revisited periodically to reflect any changes in emissions projections or reduction potential, and the County will leverage additional or new resources and incentives to further work toward this ambitious target. Monitoring the progress of implementing CAP measures will be essential to understanding which actions are being fulfilled and which are not. A full GHG emissions inventory will be necessary to assess County-wide progress, but progress indicators may be monitored yearly to track the success of specific actions. Chapter 6 discusses this next step in the process of reducing GHG emissions.

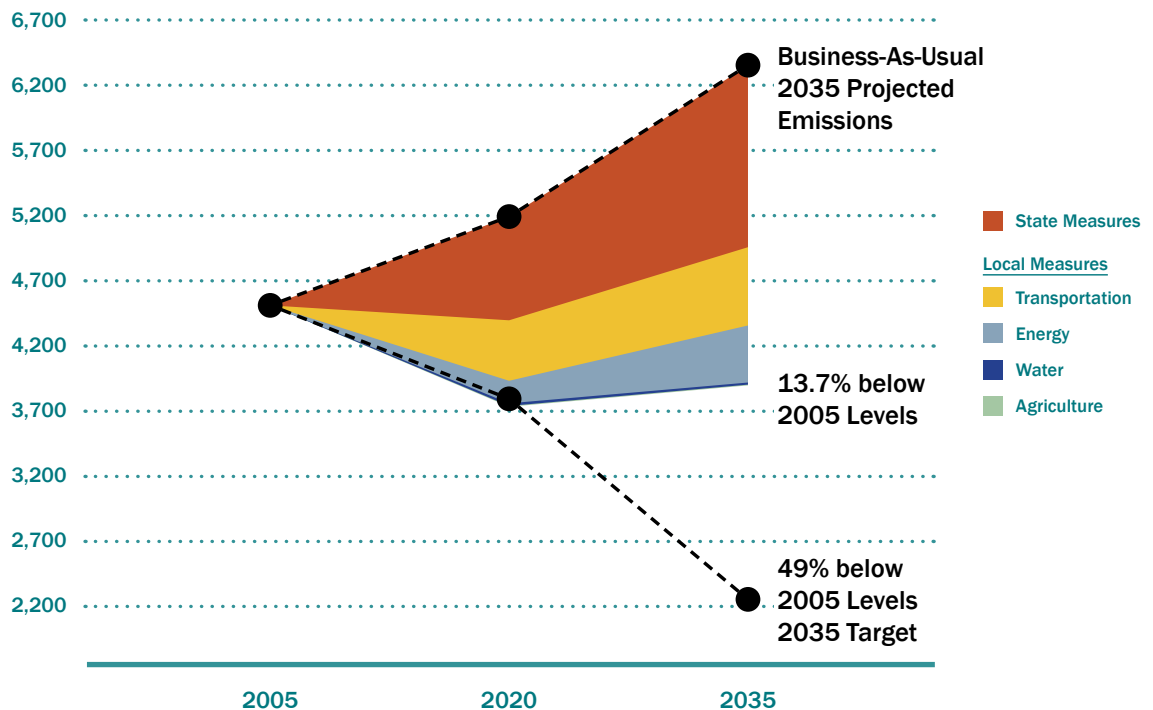
TABLE 3.2 | SUMMARY TABLE OF 2035 GREENHOUSE GAS REDUCTION MEASURES

MEASURE NUMBER	MEASURE	ANNUAL MT CO ₂ E REDUCTIONS IN 2035	SCALED MEASURE PERFORMANCE (% REDUCTION IN GHG EMISSIONS)	ASSUMPTIONS	
				PARTICIPATION RATE	PERFORMANCE LEVEL
Water					
W1	Water Conservation	16,227	0.7%	100% of residents	20% per capita reductions
Energy					
E1	Energy-Efficient New Development	22,302	0.9%	100% of new development	15% above Title 24 requirements
E2.1	Residential Building Retrofits	158,662	6.5%	90% pre-2005 residential units	Savings vary per residential type and building vintage
E2.2	Commercial Building Retrofits	14,019	0.6%	90% pre-2005 commercial units	40% reduction in lighting kilowatt hours
E3	Appliance Upgrades	53,290	2.2%	90% pre-2005 units; 100% post-2020 units	Average saving of 380 kWh per appliance and 32 kWh per light bulb replaced
E4	Smart Meters	32,106	1.3%	50% of residents with SDG&E accounts will utilize the enhanced energy monitoring capabilities to reduce energy usage	5% reductions in electrical usage
R1	Solar Water Heating (Residential and Commercial)	71,267	2.9%	Residential: 66% Commercial: 73% (90% colleges/schools, 70% other)	Reductions in energy usage: Residential: 70% Commercial: 59%
R2	Alternative Energy Systems (Residential and Commercial)	85,915	3.5%	Residential: 10% residential electricity from solar Commercial: 100 MW (13% commercial electricity use)	10 watts per square food for 6 hours
Land Use					
LU1	Mixed-Use Development	160,199	6.5%	25% of new development will occur in high density areas	4% VMT reduction
Transportation					
T1	Increase Transit Use	80,099	4.9%	2% increase in transit ridership	2% VMT reduction
T2	Increase Walking and Biking	120,149	4.9%	50% increase of bicycle and pedestrian facilities	3% VMT reduction
T3	Increase Ridesharing	120,149	3.3%	50% of employers using TDM	3% VMT reduction
T4	Alternative-Fuel Vehicles	120,149	4.9%	15% increase in electric vehicle purchase	3% VMT reduction
Agriculture					
A1	Nitrogen Optimization	177	0.01%	5% growers	20% reduction in nitrogen fertilizer
A2	Field Equipment Fuel Efficiency	3,924	0.2%	35% field equipment	15% fuel efficiency increase
A3	Agriculture Irrigation Pump Efficiency	1,616	0.1%	40% pumps	50% reduction in energy usage

MEASURE NUMBER	MEASURE	ANNUAL MT CO ₂ E REDUCTIONS IN 2020	SCALED MEASURE PERFORMANCE (% REDUCTION IN GHG EMISSIONS)	ASSUMPTIONS	
				PARTICIPATION RATE	PERFORMANCE LEVEL
Landscaping and Open Space					
LS1	Plant Trees	2,475	0.2%	10,000 trees planted by 2035	1,696 MT reduction from energy savings; 779 MT sequestration benefit
Total County Action		1,062,724	43.3%		
State and Federal					
SF1	Pavley – Passenger Auto and Light Truck Fuel Efficiency	782,246	31.8%	Regulatory	
SF2	Low Carbon Fuel Standard	180,808	7.4%	Regulatory	
SF3	Renewable Portfolio Standard	198,821	8.1%	Regulatory	
SF4	Tire Pressure Program	10,063	0.4%	Regulatory	
SF5	Heavy-Duty Vehicle Aerodynamics	11,211	0.5%	Regulatory	
Total State and Federal Action		1,393,895	56.7%		
Total Reductions (County, State, and Federal Actions)		2,456,619	100%		
Percent Reduction below 2005 Baseline		17.4%			

THOUSAND
METRIC TONS
CO₂E PER YEAR

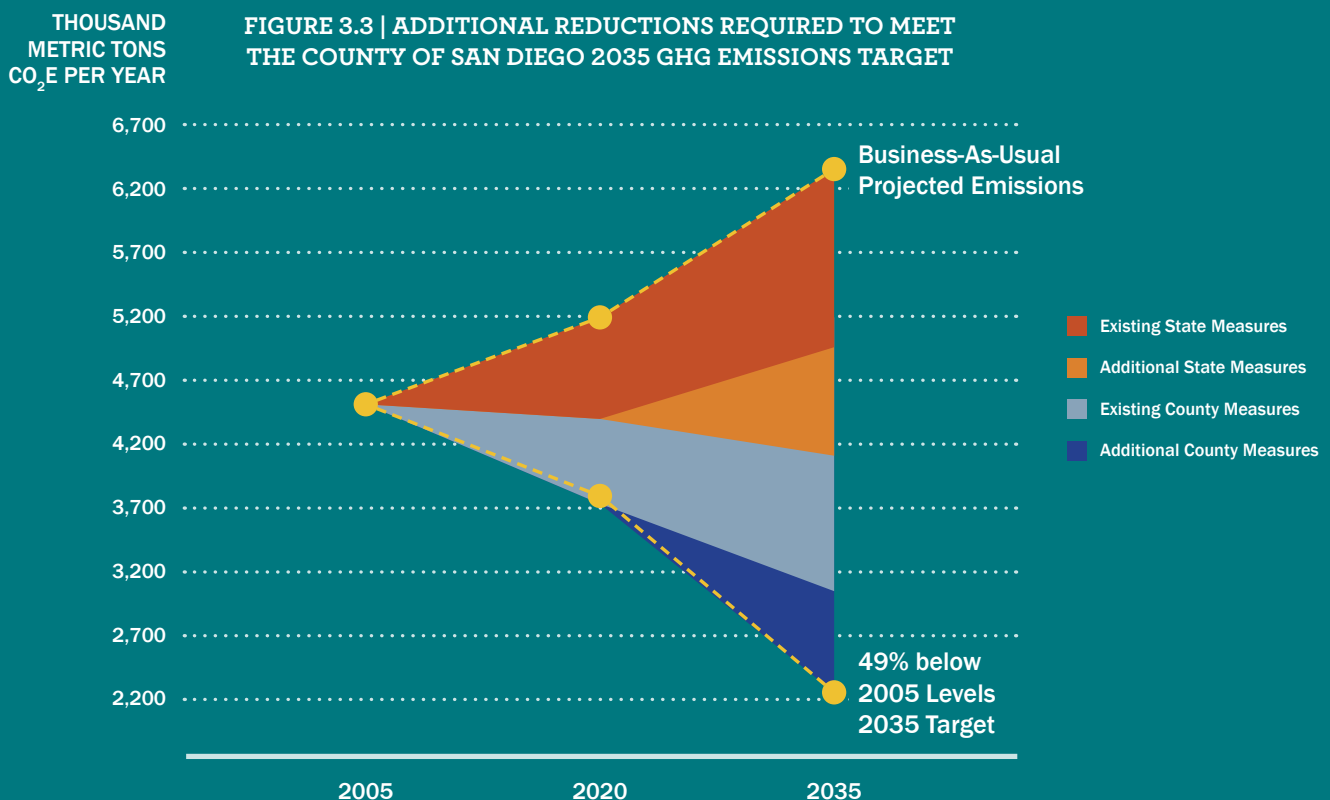
FIGURE 3.2 | 2035 GHG REDUCTION POTENTIAL BY SECTOR



MEETING THE 2035 TARGET

The current 2035 scenario represents the County’s best assessment of what would be achievable given existing conditions. The County is dedicated to meeting legislative goals and has developed scenarios to determine how it could reduce emissions 49% below 2005 levels by 2035. Reducing emissions from a BAU scenario would require mitigating more than 4 MMT CO₂e, which would only be achievable through additional local, state, and federal actions. Figure 3.3 illustrates the additional state, federal, and local reductions that would be needed to meet the target. The level of reductions that were assumed for the local level is proportional to those in 2020 (44.6%), while the remaining gap would need to be filled by additional state and federal measures. Details

of how this scenario could be achieved are provided in Appendix D, and include measures that may not be currently economically, technically, or politically feasible, such as implementing net-zero energy requirements on new buildings, increasing the LCFS to 30% at the state/federal level, and requiring organic waste diversion and 20% reduction in VMT at the local level. This demonstrates the challenge facing the state and the level of commitment needed at many levels to achieve these ambitious targets. As discussed throughout the CAP, the measures will be monitored and the CAP will be updated to reflect changing conditions, which may make the goal achievable as 2035 approaches.



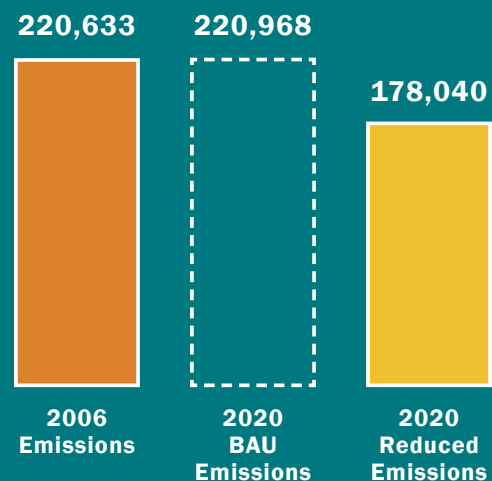


Ch. 4

Local Government Measures and Actions

The County of San Diego is a leader in energy conservation,

exemplified within the community and within County operations. Since the energy crisis of 2000, the County has reduced internal consumption by 14% through retrofits, new construction standards, and energy usage policies. The County will continue to work toward reducing energy use. There are more than 15,000 County government employees serving more than 3 million residents. There are more than 300 County-operated buildings with nearly 10 million square feet; therefore, this is an area where large, strategically planned reductions can occur. The County devised a Strategic Energy Plan (SEP) to last through 2012 to help reach energy reduction goals. The actions in this CAP align with the SEP goals and extend some of them beyond the 2012 SEP horizon year.



The County's internal operational goals for GHG emissions reductions are the same as those for the community: to achieve 15% below baseline emissions by 2020. The following table summarizes the local government-level strategies and GHG reductions, plus applicable state-level reductions. Through the CAP, the County can exceed its goal and achieve 19% GHG emission reductions relative to 2006 by 2020.

The County identified five overarching strategies, with many actions within each strategy, to achieve significant reductions by 2020:

- Reduce Energy Consumption
- Energy-Efficient New Construction
- Renewable Energy
- Utility Monitoring and Reporting
- Fleet and Fuel Efficiency

MEASURE NUMBER	STRATEGY	2020 REDUCTIONS MT CO ₂ e/YEAR	PERFORMANCE LEVEL
M-1	Reduce Energy Consumption	6,443	Reduce energy consumption 1% per square foot per year
M-2	Energy-Efficient New Construction	2,005	Exceed Title 24 Building Standards for new construction and major renovation
M-3	Renewable Energy	NA ¹	Provide at least 2% of the County's annual electricity usage from renewable energy systems by 2012
M-4	Utility Monitoring and Reporting	NA ¹	Monitor and track energy and water usage of all large facilities
M-5	Fleet and Fuel Efficiency	2,859	5% increase in fuel efficiency by 2013 and 1% increase in fuel efficiency per year 2014-2020
State	RPS	13,135	Regulatory
State	Pavley	12,362	Regulatory
State	LCFS	5,848	Regulatory
State	Tire Pressure	273	Regulatory
State	HDV ²	3	Regulatory
2006 Baseline Emissions		220,633	
Business-as-Usual 2020 Emissions		220,968	
Total Reductions		42,928	
Net 2020 Emissions		178,040	
Percent Reduction Below Baseline		19%	

¹ The emission reductions from these measures could not be quantified.

² Heavy-Duty Vehicle GHG Emission Reduction Measure; applied only to vehicle fleet, not employee commutes.

M-1 Reduce Energy Consumption

The County was proactive in auditing and retrofitting buildings well before AB 32 and other climate change measures were enacted. By 2006, the County had performed retrofits on more than two dozen major facilities. These actions resulted in 14% reductions in electricity usage and 9% reduction in natural gas usage per square foot. The East Mesa Detention Center, North County Regional Center, and Health Services Complex have all undergone retrofits since the baseline inventory, helping to achieve the SEP and CAP goals. Ongoing retrofits, largely funded by the federal government's EECBG, will account for additional reductions by 2012.

Specific actions that the County has or can take are as follows:

- Energy Efficiency Retrofits
- Energy-Efficient Purchasing Policy
- Optimization of Building Operations

	STRATEGY ¹	GHG EMISSIONS REDUCTION POTENTIAL (MT CO ₂ E)
Existing SEP Strategy	Reduce energy consumption 1% per square foot per year; 2009–2012	1,828
Continued Strategy	Reduce 1% per square foot per year; 2009–2020	6,443

¹ SEP strategies are assumed to be fully implemented and effective; therefore, projected GHG reductions may include past years.

COUNTY ACTION IN FOCUS

As part of its ongoing effort to reduce energy consumption, the County replaced existing compressors for its 450-ton chiller at the Juvenile Hall Complex with new energy-efficient Turbocor TT400 compressors. These new compressors use magnetic bearings to levitate the rotor shaft and impellers during compression, which reduces noise and vibration during operation. With an integrated variable-frequency drive (VFD), energy efficiency is maximized even with a partial or low load. This project helped the County save an estimated \$109,000 a year in energy costs. This is just one of the many energy efficiency projects that have already been completed or are still in the construction or planning phases in the County.



M-2 Energy-Efficient New Construction

The County is currently undertaking major construction projects that provide an opportunity for energy efficiency in new buildings. California's Title 24 establishes standards for energy efficiency in new and renovated buildings; however, the County has committed to exceeding these standards both to reduce emissions and to distinguish itself as a leader of energy efficiency in the community. The San Elijo Nature Center, for example, is LEED Platinum certified—the highest possible certification from the Green Building Rating System. Future plans include achieving LEED Platinum rating for the Planning Commission Facility, set for completion in August 2012, and the County Operations Center, which will encompass a campus of LEED-certified buildings and replace older, less efficient County buildings.

	STRATEGY ¹	GHG EMISSIONS REDUCTION POTENTIAL (MT CO ₂ E)
Existing SEP Strategy	Exceed Title 24 Building Standards for new construction and major renovation 2009–2012	1,320
Continued Strategy	Continue through 2020	2,005

¹ The level of development within County and community operations is uncertain. To assess the potential reductions related to new construction or major renovations, only active projects (approved and funded) were included in the estimates through 2012. For the continued strategy, all active, approved, and proposed projects over the next 5 years were assumed to be constructed by 2020.

COUNTY ACTION IN FOCUS

Still under construction, the County's new Operations Center represents the ongoing implementation of emissions-reduction measure M-2. It is on track to achieve a LEED Gold rating, and will exceed Title 24 energy requirements by 28% and reduce water consumption by 40%. To maximize energy efficiency, the new buildings will implement the following:

- A 400-kW photovoltaic system
- Energy-efficient roofing and glazing systems to reduce heat gain and improve interior day lighting
- High efficiency lighting and mechanical ventilation systems to reduce energy consumption and improve occupant comfort



M-3 Renewable Energy

Part of the SEP is to provide at least 2% of the County's annual electricity usage from renewable energy systems by 2012. The County has already begun investing in renewable energy systems. New construction of County buildings (e.g., the recently completed Medical Examiner and Forensic Center, and the current construction of the East Mesa Detention Center and Crime Lab) includes installation of renewable energy systems. This strategy supports M-1 and M-2, which seek to reduce energy in existing and new buildings. While this measure could result in greater emissions reductions, the potential for overlap between measures would make this a supporting measure and therefore the emission reductions from this measure were not quantified in this document.

M-4 Utility Monitoring and Reporting

One of the County goals is to monitor and track energy and water usage of large facilities and to provide this information to facility operators. While this strategy does not call for direct action related to GHG emissions reductions, this type of information is useful in reducing demand, identifying where efficiencies can be achieved, and ultimately reducing GHG emissions. Therefore, the emission reductions from this measure could not be quantified but it is included as an important supporting measure to the other energy efficiency strategies. This tool will be valuable for the CAP monitoring plan, as discussed in Chapter 7.

M-5 Fleet and Fuel Efficiency

The County’s vehicle fleet provides services to both the unincorporated County and to cities. Sheriffs, Parks & Recreation, Registrar of Voters, and Health and Human Services are just some of the County departments that rely on the fleet’s 2,900 vehicles to properly serve the County. The nearly 3 million miles traveled in these vehicles accounted for 11% of the County’s emissions in 2006. The County is already making progress toward reducing emissions related to its vehicle fleet. The County’s vehicle fleet makeup includes 167 hybrid, 25 electric, and 16 compressed natural gas (CNG) vehicles. To reduce miles traveled, the County uses Webex® to conduct remote meetings, resulting in less fuel used for travel. The large vehicle fleet operated by the County provides an opportunity for significant emissions reductions through the strategies described below. In addition, the mobility of the County fleet provides the added benefit of promoting energy efficiency in the community by example.

	STRATEGY ¹	GHG EMISSIONS REDUCTION POTENTIAL (MT CO ₂ E)
Existing SEP Strategy	5% fuel efficiency gain 2009–2012	1,248
Continued Strategy	Continue at 1% greater efficiency per year 2013–2020	2,859

¹ SEP strategies are assumed to be fully implemented and effective; therefore, projected GHG reductions may include past years.

COUNTY ACTION IN FOCUS

Spanning roughly 4,200 square miles, San Diego County covers an expansive area, with 1,680 government buildings located throughout the region. Because of this, some employees in the same department can often be separated by more than 30 miles. To meet the significant challenge of meeting and communicating over such large distances, the County incorporated WebEx® technology into its operations. This telepresence technology allows County employees to meet and discuss work right from their desks. This eliminates the need to drive to meetings, helps reduce carbon emissions, and also helps reduce costs and save taxpayer funds. Costs for meetings have been reduced from \$59 per person for a single meeting to less than \$20 per person for an entire month of meetings. Furthermore, based on cost data tracked for 900 Cisco WebEx® sessions and 3,500 employees, the County estimates that this saved taxpayers more than \$45,000 in staff time and travel costs.





Ch. 5

Adaptation

ADAPTATION IN SAN DIEGO COUNTY

Although rising awareness and concern regarding potential climate change impacts has led to many policy responses and programs aimed at reducing GHG emissions at the County, state, national, and global level, we are likely already seeing and feeling some impacts of climate change, and other more serious consequences will occur despite climate mitigation efforts. While GHG mitigation initiatives are important for long-term climate stabilization, scientists warn of the time it takes for the climate system to respond to GHG reductions. Regardless of future emissions, the GHG concentrations already in the atmosphere commit us to a likely range of climate change impacts in the near future. Jurisdictions are recognizing the role of adaptation planning, which is an essential extension of climate change mitigation. Local governments can make important decisions relevant to adaptation, such as emergency preparedness, and are beginning to take a more active role in climate adaptation planning. While this document is not meant to serve as a climate adaptation plan, it is important to recognize the potential effects of climate change in the County, and to highlight potential strategies that may help the County adapt to those effects. This chapter outlines some climate change effects to the County and potential adaptation strategies that the County may consider to best prepare for or co-exist with actual or expected effects of climate change.

Several studies on the effects of climate change in the County have been conducted recently. The San Diego Foundation's Focus 2050 Report, San Diego County Water Authority's 2010 Urban Water Management Plan and the 2009 Annual Report, and the 2007 San Diego County Firestorms After Action Report detail some of the possible effects of climate change in the County, including a hotter and drier climate, increased droughts, rising sea level, an increased frequency and severity of wildfires, and decreasing water and energy security. These effects could have a significant impact on property, public health, and safety.

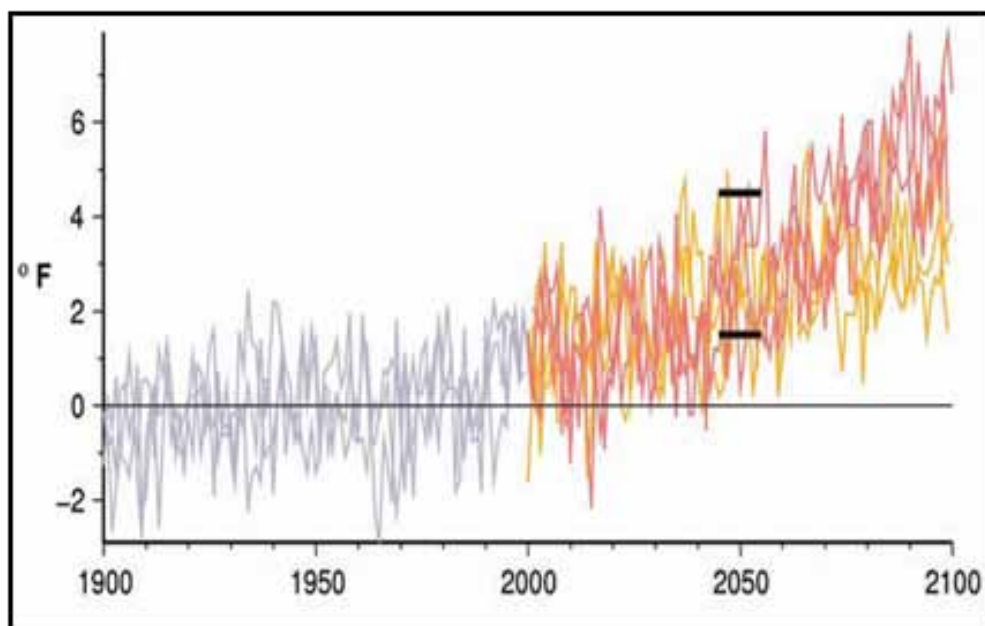
INCREASING FREQUENCY OF EXTREME WEATHER EVENTS

HEATWAVES

One of the most significant risks of heat waves is the likely increased levels of heat stress and death caused by extreme temperatures. Heat waves have claimed more lives over the past 15 years than all other declared disaster events combined in California. While many of these deaths occurred in more central parts of the state, the San Diego region reported at least five deaths during the 2006 heat wave. This is of particular concern for older adults and the infirm, as well as for those with heart or respiratory problems. By 2050, almost one-quarter of the region's residents (more than 1 million people) will be 65 and older, with more than half being older than 41. This older population will be more vulnerable to the public health impacts of climate change, such as heat waves and air pollution. With the prevalence of air-conditioner use during high-temperature

events, demand for power may outstrip supply and cause a power blackout; this was the case during the heat waves of 2007 when thousands of residents lost power. This risk is compounded during a heat wave, because even more people and businesses will manage their heat stress with air conditioning. If the outage is sufficient to disrupt public transportation, mass stranding of passengers may also occur. The Focus 2050 report estimates that temperatures in the San Diego region will rise between 1.5°F and 4.5°F by 2050. This warming will be exaggerated in the summer, when temperatures will warm by as much as 2°F more than in the winter, and in the inland areas of the County, where the majority of County residents live, where warming could be as much as 2°F higher than the warming that occurs near the coast.

PROJECTED TEMPERATURE INCREASE FOR SAN DIEGO COUNTY



Source: San Diego Foundation Regional Focus 2050 Study

FLASH FLOODING

With a high degree of variability of annual precipitation, San Diego County can be vulnerable to flash flooding, especially in the central and eastern areas where mountain canyons, dry creek beds, and high deserts are the prevailing terrain. These floods have serious impacts on public health, transportation infrastructure, and power service, and can result in severe property damage and even deaths. Even small flooding events have been known to cause public transportation disruptions. Power outages due to storm damage can compound transport delays and put populations dependent on electricity for health needs at risk. Deaths, injuries, and destruction of

property due to storm damage, flash flooding, and erosion of hillsides are also significant risks in these events. Storm water events, although providing water inflows, are also a main case of toxin infiltration, because as storm water runoff passes through developed parts of the County, it picks up pollutants such as animal waste, automotive fluids, and anything else in its path. The effects of storm events may be mitigated by habitat restoration projects, which would restore the native vegetation that absorbs floodwaters and slowly releases runoff into watersheds. As a result, these habitats increase the resiliency of adjacent areas in times of significant precipitation.

ELECTRICAL DEMAND

In addition to the health and public safety risks associated with warmer temperatures, and compounded by the region's growing population, the County faces challenges to its energy supply. In 2006, peak demand for electricity was the highest on record for the region, mostly because of air conditioners

running during that year's unusually hot summer. Additionally, efficiencies of electricity generation and transmission decrease as air temperatures increase, which further inhibit the ability of electric providers to meet the increased demand expected as changes in the climate take place.

INCREASING VARIABILITY OF PRECIPITATION

DROUGHT

Water availability is and has been a vital issue in Southern California; multiyear droughts can push the limits of water supplies, while population growth keeps the demand for water increasing. This will only intensify as climate change stresses water supplies available from the San Diego County Water Authority, with expected demand to increase by as much as 60% (or 39% after adjusting for planned water conservation) by 2035. San Diego's water is supplied from three main sources: the Colorado River (54%), the State Water Project (28%), and local sources (18%). Another source of water for County residents is water pumped from private wells. While the full extent of water availability from these wells is not known, it can be assumed that a growth in population and increased demand due to reduced natural rainfall and increased temperatures will stress this water supply source as well. Each of these sources already faces challenges, which will be further stressed by climate change. The Sierra Nevada snowpack provides water for the State Water Project by accumulating snow during wet winters and releasing it slowly during dry springs and summers. Warmer temperatures will cause smaller snow packs to melt faster and earlier, making it more difficult to store and use. By 2050, scientists project a loss of at least 25% of the Sierra snowpack. This loss of snowpack means less water will be available for Californians to use in the summer when it is needed the most. The Colorado River is also vulnerable to climate change, with some estimates stating that water flows will decrease by up to 20% by 2050. Climate change is also expected to result in more variable weather patterns throughout California. More variability can lead to longer and more severe droughts. Senate Bill (SB) 7X 7, discussed in Chapter 3, is already anticipating this change by requiring a significant reduction in urban water consumption by 2020. The most significant and inherent risk of drought is insufficient water supply. While it is a positive sign that many County residents are aware of the scarcity of potable water and have made significant reductions in consumption in recent times, this may also mean that many water savings measures have already been addressed and, with an increasing population, further savings may be challenging.

WILDFIRES

San Diego's unique combination of fire-prone vegetation and, at times, high temperatures combined with high winds means that fires here are not only frequent, but can be large and intense. This was demonstrated by the 2007 firestorms that, at its maximum, consisted of seven fires burning simultaneously. The 2007 fires resulted in 10 civilian deaths, 23 civilian injuries, and 89 firefighter injuries, and consumed approximately 369,000 acres, or about 13% of the County's total land mass. Additionally, the fires destroyed an estimated 1,600 homes, 1,055 outbuildings and structures, and 239 vehicles. The costs incurred to contain the fires are estimated at more than \$40 million, and the total damage costs are expected to exceed \$1.5 billion. As a result of these fires, more than 515,000 County residents received voluntary or mandatory evacuation notices, which exceeded the number of residents evacuated from New Orleans during Hurricane Katrina. As a result of climate change, higher spring temperatures, scorching summers, drier vegetation, and longer fire seasons can be expected, which will all lead to an increased risk of wildfires.



CLIMATE ADAPTATION STRATEGIES

The effects of climate change will increase over time; however, there are a range of strategies that begin to address the new and different conditions that climate change will bring to the County. Prior to devising a comprehensive adaptation plan for the County, there are many strategies that provide immediate benefits, such as improved water supply, public health, and energy efficiency. While not an all-inclusive list, the strategies below provide a useful starting point for the County to begin to adapt to new environmental and legislative realities. Many of the adaptation strategies also overlap with the GHG-reduction strategies listed above. In these cases, the GHG-reduction strategies are noted in italics.

POTENTIAL STRATEGIES FOR WILDLIFE AND OPEN SPACE

- The Multiple Species Conservation Program (MSCP) provides valuable habitat for sensitive biological species in San Diego County. As climate change effects the habitats throughout San Diego County it is important that species have access to other habitats that better fit their needs. By expanding the MSCP it will provide more available habitat options for species effected by climate change. Because the MSCP will be effected by climate change it is also important that the MSCP be evaluated, and updated where necessary, to ensure that its goal will not be compromised by climate change.
- Another benefit of ensuring that land is preserved for wildlife is that the natural process of carbon sequestration, in the soil and plant life, will continue. If this land was allowed to be developed this sequestration would be stopped and the carbon that was sequestered would most likely be released.
Strategy: Landscaping and Open Space

POTENTIAL STRATEGIES FOR WATER AND WASTEWATER

- Encourage the application of Low Impact Development, which would ease peak flows. For example, require projects to capture and manage a specific amount of rainwater per storm through on-site infiltration, retention, and biofiltration.
- Expand water recycling and develop local water supplies that would not be affected by climate change. Examples include storm water harvesting, which can assist in both controlling flash flooding events and serve as a water supply, and single-source grey water reuse. *Strategy: Water*
- Implement all best management practices for water use efficiency and encourage the public to implement similar measures to reduce water demand, wastewater discharges, and energy demand. Efficient water use can help the County cope with water shortages, thus reducing economic and environmental impacts. *Strategy: Water*

POTENTIAL STRATEGIES FOR PUBLIC HEALTH

- Reduce the urban heat island effect through cool-roof technology, consideration of cool roadway materials, addition of shade trees in parking lots and next to sidewalks, and creation of additional green space throughout the County. *Strategy: Energy and Landscaping and Open Space*
- Consider mapping neighborhoods that could be more vulnerable to the effects of climate change, such as sea-level rise, flooding, fire, and the urban heat island effect. Include considerations of housing quality and transportation access.

POTENTIAL STRATEGIES FOR BUILDINGS AND ENERGY

- Improve building envelopes and encourage the application of green-roof or cool-roof technology to reduce the urban heat island effect of development and reduce the need to cool buildings with air conditioning during hot weather. *Strategy: Energy*
- Plant shade trees and follow up with proper maintenance to ensure that they are able to grow and thrive. A 10% increase in vegetation cover can reduce ambient temperatures by 1°F to 2°F. The trees also provide significant co-benefits such as reducing habitat fragmentation, storm water pollution, and flooding. *Strategy: Landscaping and Open Space*
- Encourage energy conservation, implement energy efficiency strategies, and facilitate renewable energy installation to reduce pressure on the electrical grid during heat waves and drought conditions. *Strategy: Energy*

POTENTIAL STRATEGIES FOR WILDFIRES

- Develop short- and medium-term climate change adaptation strategies for forests and other fire-prone habitats, and improve development standards to reduce exposure to fire risk at the urban/wildland interface.
- Restore fire-adapted ecosystems to withstand naturally recurring wildfires.
- The County's fire departments, in conjunction with other regional fire fighting agencies, should evaluate and plan for an increased risk of larger and more frequent wildfires.



Ch. 6

Monitoring and Project Compliance

MONITORING

The CAP itself does not ensure reductions and, therefore, it is imperative to monitor progress toward the goals set in this document and to revisit and update the CAP periodically. Each strategy described in the CAP includes performance indicators that describe how the potential reductions may be achieved, including assumptions about participation rates and efficiencies.

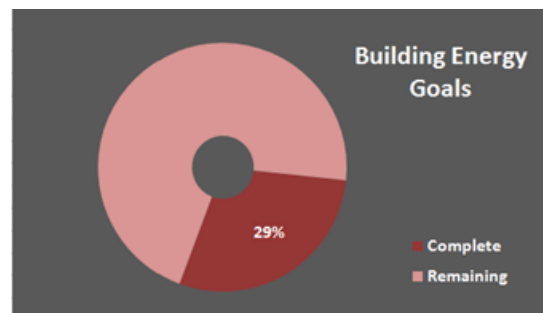
To track the CAP's progress toward GHG emissions-reduction goals, the County's Climate Team will coordinate monitoring efforts at the community and local government levels. A monitoring tool was created to easily assess key components of the CAP annually, and the County will regularly conduct a GHG emissions inventory to gain the full picture of GHG emissions in the County. While a full GHG emissions inventory is necessary to assess community-wide and government-wide progress toward the 2020 goal, the monitoring tool can track progress between inventories and examine the effectiveness of specific actions. This tool, created specifically for use with the County's CAP, includes easily attainable metrics that are related to specific measures. These metrics are generally already available to the County, but can be used with the tool to show progress toward the goals set in the CAP. For example, when commercial applicants apply for a permit to install solar PV systems, the County's Planning Department will then know the square footage of anticipated PV to be installed. The CAP includes a goal of achieving 5.5 million square feet of PV on commercial buildings by 2020; the information already collected by the County can be put into the tool to see the progress toward the individual goal, the sector goal (Buildings and Energy, see the pie chart as an example), or the overall community-wide goal. The tabular and graphic output will allow for quick understanding of measure performance, which can be used to apply for grants, provide information to decision-makers to reallocate funding, or show compliance with the goals of AB 32.

The County is already undergoing a 2010 GHG emissions inventory that will be submitted to The Climate Registry and may be used as a benchmark of programs implemented since the baseline inventory.

Success of the CAP will rely on the County, public, and private entities participating and becoming engaged in this process.

The County recognizes that reducing GHG emissions is one of the most critical challenges facing the world today. This CAP provides an implementation pathway for the County's GHG reduction efforts. This chapter describes how the County will implement the GHG reduction measures and actions contained in the CAP.

EXAMPLE OUTPUT FROM MONITORING TOOL



PLAN EVALUATION

Two types of performance evaluations are important: evaluation of the CAP as a whole and evaluation of the individual measures. Community-wide GHG emissions inventories will provide the best indication of CAP effectiveness, although it will be important to reconcile actual growth in the County versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2005 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction target. The County will coordinate community-wide inventories in the future to assess the level of GHG-reduction-goal attainment.

While community-wide inventories provide information about overall GHG reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve the ability of staff and decision makers to manage and implement the CAP. The County can promote successful measures and reevaluate or replace under-performing ones. Evaluating measure performance will require data on actual community participation rates and measurement of GHG-reduction capacity.

The County Department of Planning and Land Use, in conjunction with the Department of Public Works and Department of General Services, will coordinate measure evaluation on the same schedule as the community-wide inventories, and summarize the progress toward meeting the GHG-reduction goals. This report will describe the following:

- Estimated annual GHG reductions in 2020
- Achievement of progress indicators
- Participation rates (where applicable)
- Remaining barriers to implementation

If a more frequent progress review period is deemed appropriate, it would be necessary to institute an annual or bi-annual monitoring program that tracks the performance of individual measures. The data collection and processing necessary to establish performance levels would be conducted by the responsible parties identified for each measure (as noted in the measure tables), and summarized at the level of each action area and for the CAP as a whole.

PLAN EVOLUTION

To remain relevant, the County must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG-reduction technologies and innovative local government strategies will be developed, new financing will be available, and state and federal legislation will advance. It is also possible that community-wide inventories will indicate that the

community is not achieving its reduction targets. As part of the evaluations identified above, the County will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes into future updates of the CAP to ensure an effective and efficient plan.

RELATIONSHIP TO THE COUNTY OF SAN DIEGO GENERAL PLAN EIR

The General Plan EIR evaluated the potential effects of implementation of the General Plan on global climate change. Two issue areas were evaluated: compliance with AB 32 and effects of global climate change on the General Plan. The issue of effects of global climate change on the General Plan was determined to be mitigable through General Plan policies and mitigation measures, as well as through compliance with AB 32.

The issue of compliance with AB 32 was evaluated by estimating the County's 1990 GHG emissions and anticipated 2020 GHG emissions. AB 32 requires that California reduce GHG emissions in 2020 to 1990 levels. The analysis concluded that emissions in 2020 would be greater than in 1990, resulting in a potentially significant

impact. The EIR cited ongoing local and state measures that would help to mitigate the impacts to climate change. In addition, numerous General Plan policies were cited (Table I-1 of the General Plan) that would reduce future project-related impacts. Finally, mitigation measures were proposed to further reduce the impacts of climate change, implementation of which would reduce the General Plan's impacts to a less-than-significant level. Among the mitigation measures was CC-1.2, Preparation of a Climate Change Action Plan. This measure called for a baseline GHG emissions inventory; detailed GHG-reduction targets and deadlines; comprehensive and enforceable GHG emissions-reduction measures; and implementation, monitoring, and reporting of progress toward the targets defined in the CAP.

The CAP contains quantified estimates for current (2005) and future (2020, 2035, and 2050) GHG emissions based on historical data and anticipated growth factors for the unincorporated area of San Diego County. The CAP includes strategies that show compliance with ARB's Scoping Plan for local governments, which is to achieve a reduction of 15% below current levels by 2020 and establishes a reduction target for 2035, recognizing that the cumulative and long-term nature of this issue necessitates planning beyond the 2020 horizon established under AB 32. The County has a range of measures that would help meet a target that is consistent with the intent of AB 32. As part of the CAP development process, a monitoring tool is being prepared to regularly assess progress toward the measure-level performance goals and overall CAP targets. The CAP will be monitored and updated, as needed, to include new legislation, technological changes, and adjustments in measures to achieve the County's target for 2020. This CAP includes all elements listed in, and therefore acts as the implementation of, mitigation measure CC-1.2 from the General Plan.

PROJECT CONSISTENCY WITH THE CAP

Another important goal of the County is to adopt the CAP as a GHG Reduction Plan (GHGRP), as defined in Section 15183.5 of the CEQA Guidelines, to provide tiering and streamlining benefits to future projects. Section 15183.5(b)(1) states that a GHGRP should do the following:

- (A) Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.
- (B) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.
- (C) Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- (D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- (E) Establish a mechanism to monitor the plan's progress toward achieving the level and require amendment if the plan is not achieving specified levels.
- (F) Be adopted in a public process following environmental review.

Guidelines (A) through (D) are contained in the CAP and (E) is being prepared concurrent with the CAP. In addition, an Initial Study and the appropriate environmental documentation was prepared to assess the effects of implementing the CAP, with appropriate public review. With adoption of the CAP, later projects may use the CAP for a cumulative impacts analysis if the projects demonstrate compliance.

Demonstrating compliance with the CAP is determined by use of the County CAP Compliance Checklist (Appendix H) during project review, and must be completed for all relevant projects undergoing environmental review by the Department of Planning and Land Use in the County.

DETERMINATION OF SIGNIFICANCE FOR PROJECT IMPACTS ON CLIMATE CHANGE

The CAP includes GHG-reduction measures that, if fully implemented, would achieve an emissions reduction target that is consistent with and supports the state-mandated reduction target embodied in AB 32. Many of the measures, such as installing solar water heaters, may be applied and measured at the project level to show project-level compliance with the CAP and with AB 32. Other measures, such as increase walking and biking, are community-wide implementation strategies for which GHG reductions at the project level cannot be easily or reliably quantified; their benefit is derived from community-wide implementation. The County identified a range of feasible reduction measures in the CAP, and has quantified the effectiveness of these measures to various projects that would be implemented during buildout of the General Plan. For some project types, many of these CAP reduction measures would be relevant and should be incorporated as part of project design or mitigation. For other project types, there may be fewer CAP reduction targets that would apply.

To further ensure that the County's overall reduction target is achieved, and considering the wide range of project types the County may approve during buildout of the General Plan, the County prepared a companion document that presents a range of substantiated significance thresholds designed to apply to different project types. This document is called "Guidelines for Determining Significance: Climate Change" (Significance Guidelines). The Significance Guidelines document should be used by projects for the evaluation of impacts on climate change and provides detailed steps on how to apply thresholds to projects. A summary of the guidelines is shown in Table 6.1.

The CEQA Guidelines (Section 15064.7) encourage lead agencies to develop and publish thresholds of significance for assessing environmental impacts. The County elected to develop guidelines for determining GHG emissions thresholds in order to provide clear and consistent guidance for assessing the significance of GHG emissions impacts of proposed projects under CEQA, as a supplement to the measures outlined in the CAP.

The "dual approach" of using the County's CAP with the Significance Guidelines document is intended to provide flexibility to individual projects in addressing GHG emissions while maintaining certainty that new development in the County will achieve its "fair share" of emissions reductions. The CAP provides a range of feasible measures and quantifies their effectiveness to demonstrate that the County's reduction target can be met. The Significance Guidelines document demonstrates that if the largest individual projects incorporate their "fair share" of feasible emissions reductions, new development in the County will occur consistent with the statewide mandate set in AB 32.

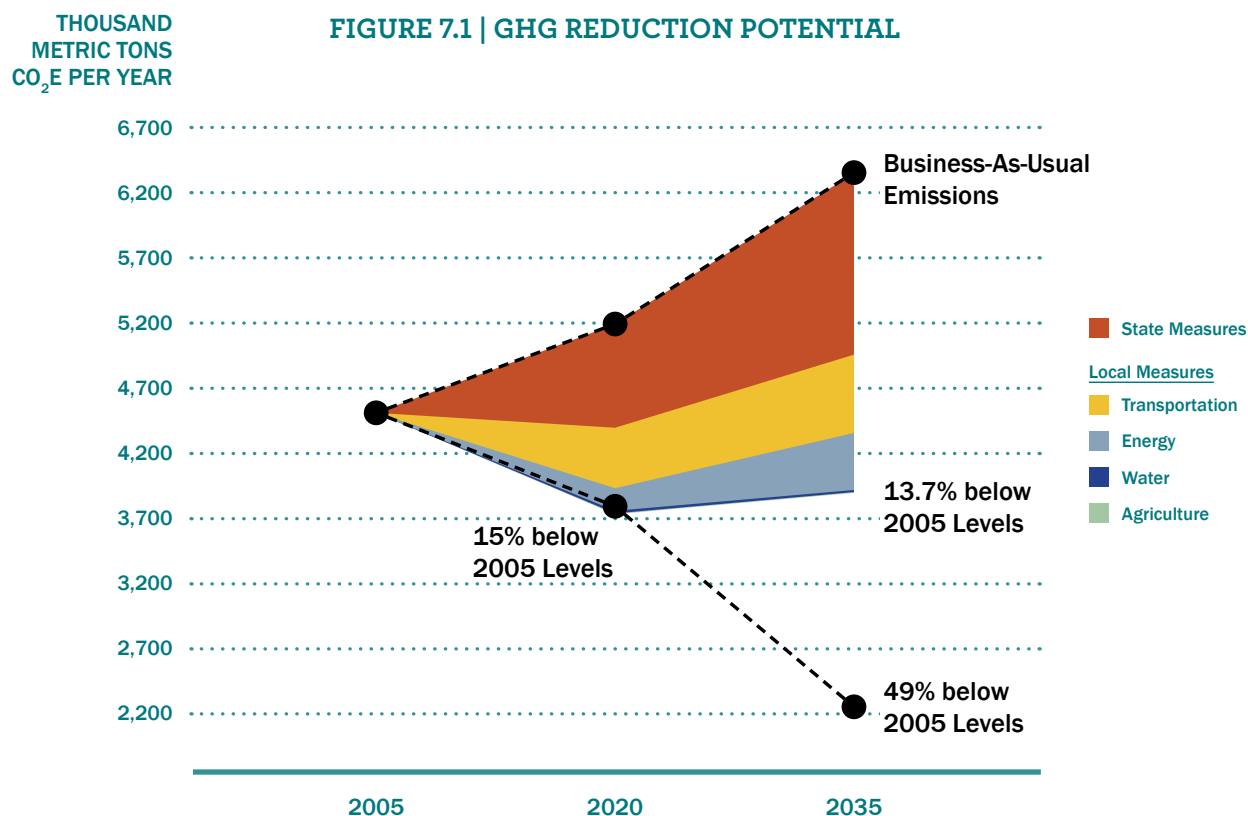
TABLE 6.1 | GHG GUIDELINES FOR DETERMINING PROJECT-LEVEL SIGNIFICANCE

TITLE	LEVEL FOR DETERMINING SIGNIFICANCE
Efficiency Threshold	4.32 MT CO ₂ e per year per service population (residents + employees)
Bright Line Threshold	2,500 MT CO ₂ e per year
Performance Threshold	16% GHG emission reductions below unmitigated project in 2020
Stationary Source Threshold	10,000 MT CO ₂ e per year



Ch. 7

Conclusion



This CAP represents the County of San Diego’s commitment to fighting global climate change and complying with state and federal legislative mandates by reducing GHG emissions from both government operations and community activities. Although climate change presents a new type of challenge for residents and businesses, this CAP is a powerful tool in meeting the County’s goals.

With this document, the County has demonstrated its commitment to mitigating GHG emissions by thoroughly examining the sources of emissions, GHG reduction strategies, and the costs and efficacy of these strategies.

There are local benefits to taking action against global climate change, and the citizens of the County will benefit from improved public health from reduced air and water pollution, reduced potential disruptions to the climate system that protects people from extreme weather events, and decreased dependence on fossil-fuel-based energy sources, among other benefits.

Although County agencies are taking action against climate change, community action is critical to achieving the emissions-reduction goals that support physical well-being and economic vitality. By building on the framework set out in this CAP and the accompanying User’s Guide (Appendix A), the citizens of the County have the necessary tools to build a community that not only creates a sustainable, healthy environment for themselves and future generations, but also sets an example for other communities and affects climate systems throughout the world.



Appendices